

# Service Manual

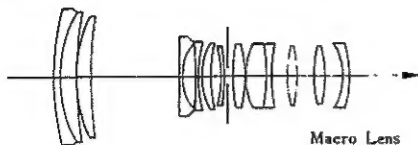
**MINOLTA 110 ZOOM SLR MARK-II**

**CODE No. 0273**

**minolta**

# MINOLTA 110 ZOOM SLR MARK II (0273)

ZOOM ROKKOR-MACRO 25~67mm F3.5



Compact, Single-Lens-Reflex camera for No. 110 film cartridge with Zoom/Macro lens and automatic exposure control

## LENS

Lens elements : 12 elements in 10 groups (Swing macro element 13 elements in 11 groups)

Diaphragm : Auto pre-set apertures

Aperture scale : 3.5 4 • 5.6 • 8 • 11 • 16  
(• point intermediate click stops)

Diaphragm blade : 6 blades

Photo macrography : Setting the lens to its macro position

## SHUTTER

Type : Metal-blade vertical traverse type, stepless electronically controlled (behind-the-lens type)

Speed : A (Auto) 1/4 to 1/1000 sec.  
Manual speed X (1/125 sec.) and B (blub)

Release : Electromagnetic, shutter release lock at low voltage

Shutter-control dial : Click stops L (shutter button lock), A (Auto), X, B

Shutter blade : 2 blades

## FLASH SYNC.

Sync. contact : X synchronization at 1/125 sec. through-contact hot shoe only at X setting and stepless automatic speed under 1/125 sec.

: LED at X (1/125) position blinks at flash-ready signal auto or manual mode with Auto Elect-roflash 118X or other X-series flashes use

## FILM ADVANCE

Winding method : Lever type, single-stroke winding (Several small strokes are impracticable)

Winding angle : Single 140° stroke after 20° unengaged movement

Counter : Paper backing appear through the film-data window

## VIEW FINDER

Type : Eye-level pentaprism type

Focusing screen : Mat-fresnel-field focusing screen with central horizontally oriented split-image focusing spot



(With action grip)

Visual field percentage : 85% (for the standard frame, 13×17 mm)

Image magnification : 0.68× (at 25mm) to 1.74× (at 67mm) focused at infinity

Eyepiece correction : -1.1 to +0.8 diopter

Mirror : Quick-return type

Indication in viewfinder : Shutter speed indicator  
1000 500 250 125 60-4

: Stepless speed indicated by 5 LEDs, LED over-/under-range indicators, LED at X (1/125) position blinks at flash-ready signal

Eyepiece shutter : Built-in eyepiece shutter position by lever

## EXPOSURE CONTROL

Metering : Full-aperture T.T.L center-weighted type by CdS cell with pentaprism-mounted

Exposure control : Aperture-priority automatic exposure

Exposure range : EV 5.6 to EV 17 (at ASA 100)

ASA sensitivity setting : Film speed setting automatically

Manual override : Up to ±2 EV continuous adjustment in 1 EV steps with locks

## FOCUSING

Focusing method : Front lens element focusing

Minimum focusing distance : 1.1 m (4 ft)

Distance scale :  $\frac{1.1}{4} \frac{1.3}{5} \frac{1.5}{7} \frac{2}{10} \frac{3}{20} \frac{7}{\infty}$  (m)  
(ft)

Focal length scale : 25 30 40 50 67

Image magnification : 0.07× to 0.19×  
(film-to-subject distance of 890 to 200 mm)

## SELF TIMER

Working time : Electronic, LED indicator, Approx. 10 sec. delay, Approx. 2.5 sec. before the exposure is made, the light will begin to blink faster

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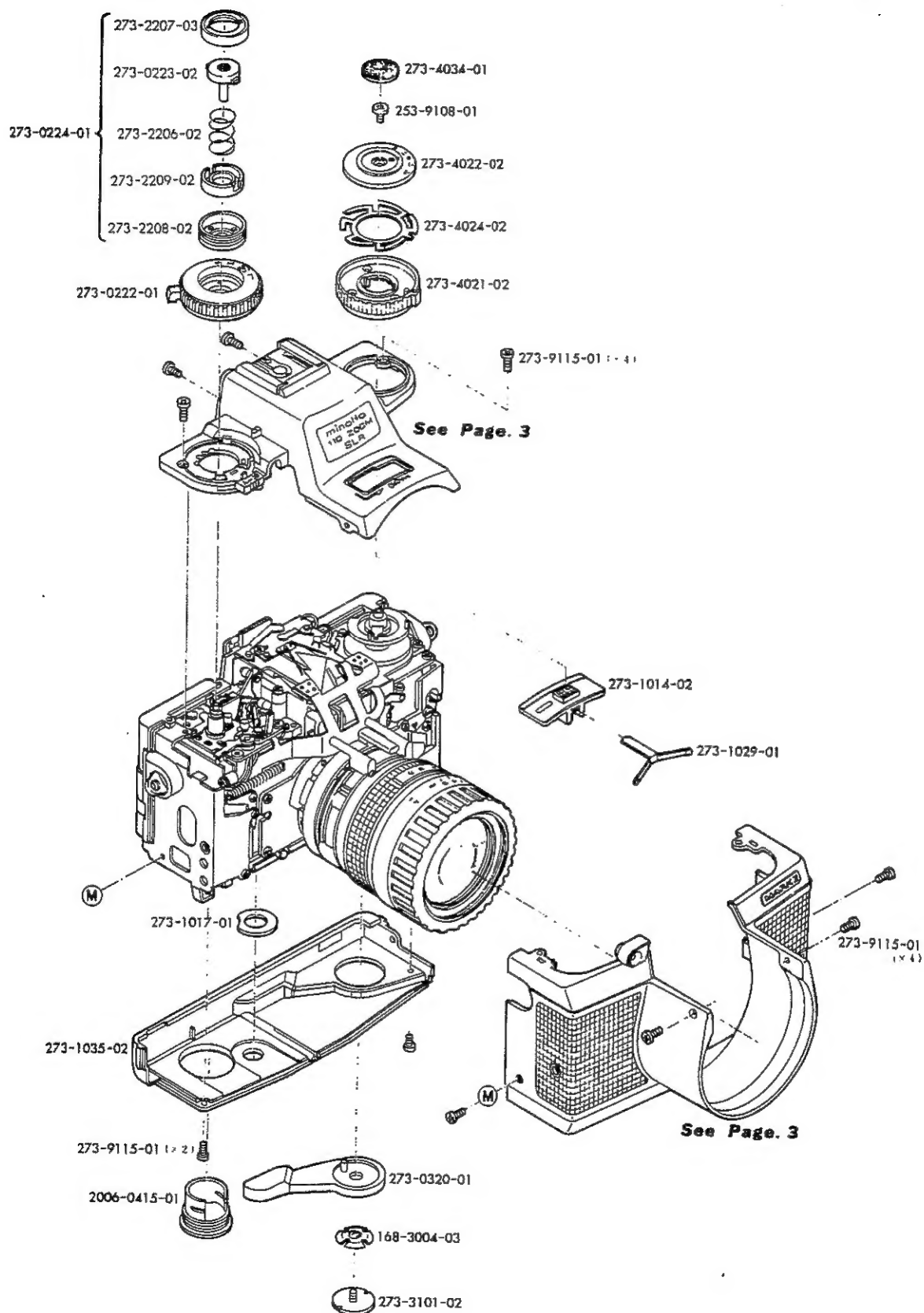
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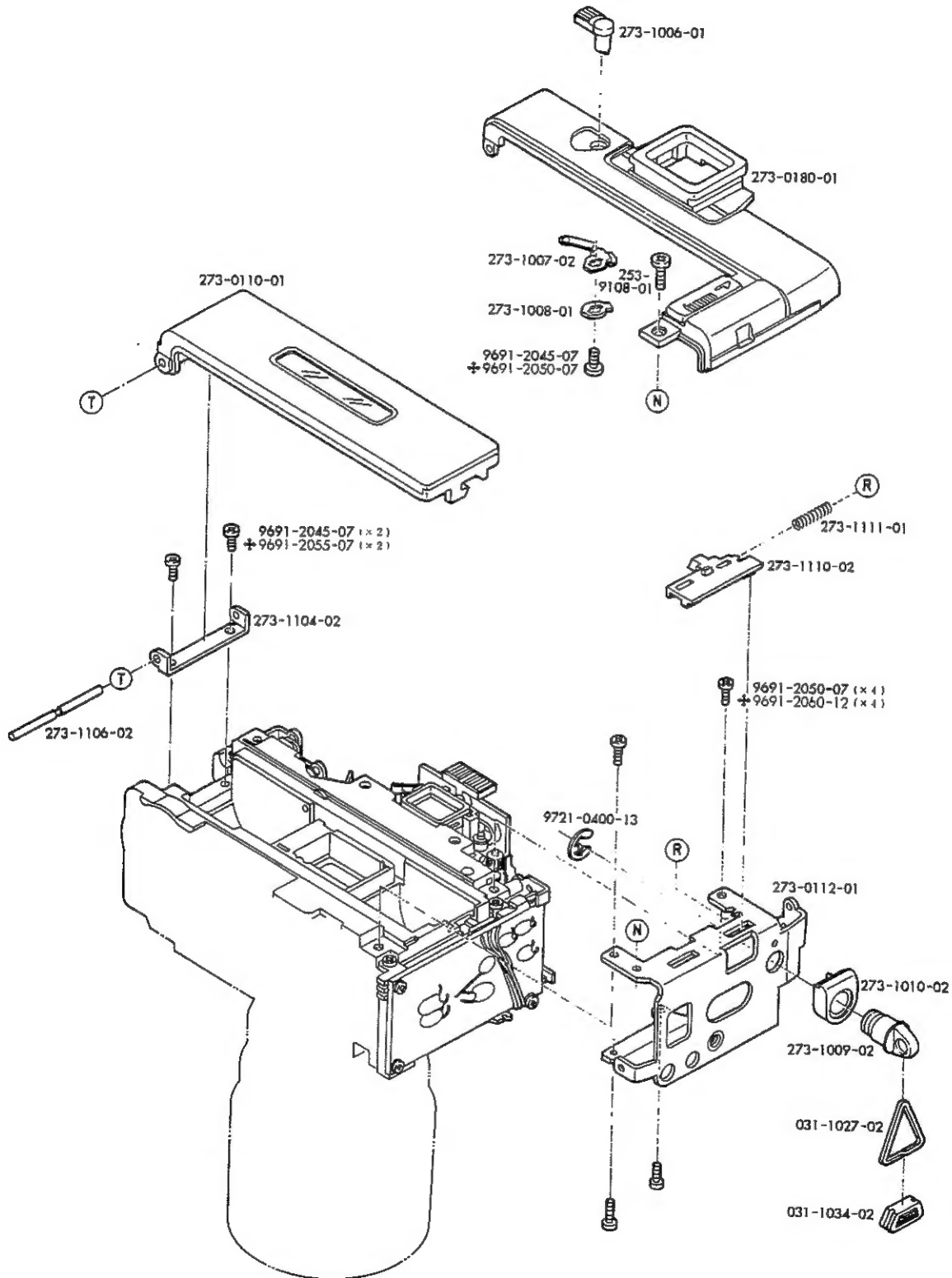




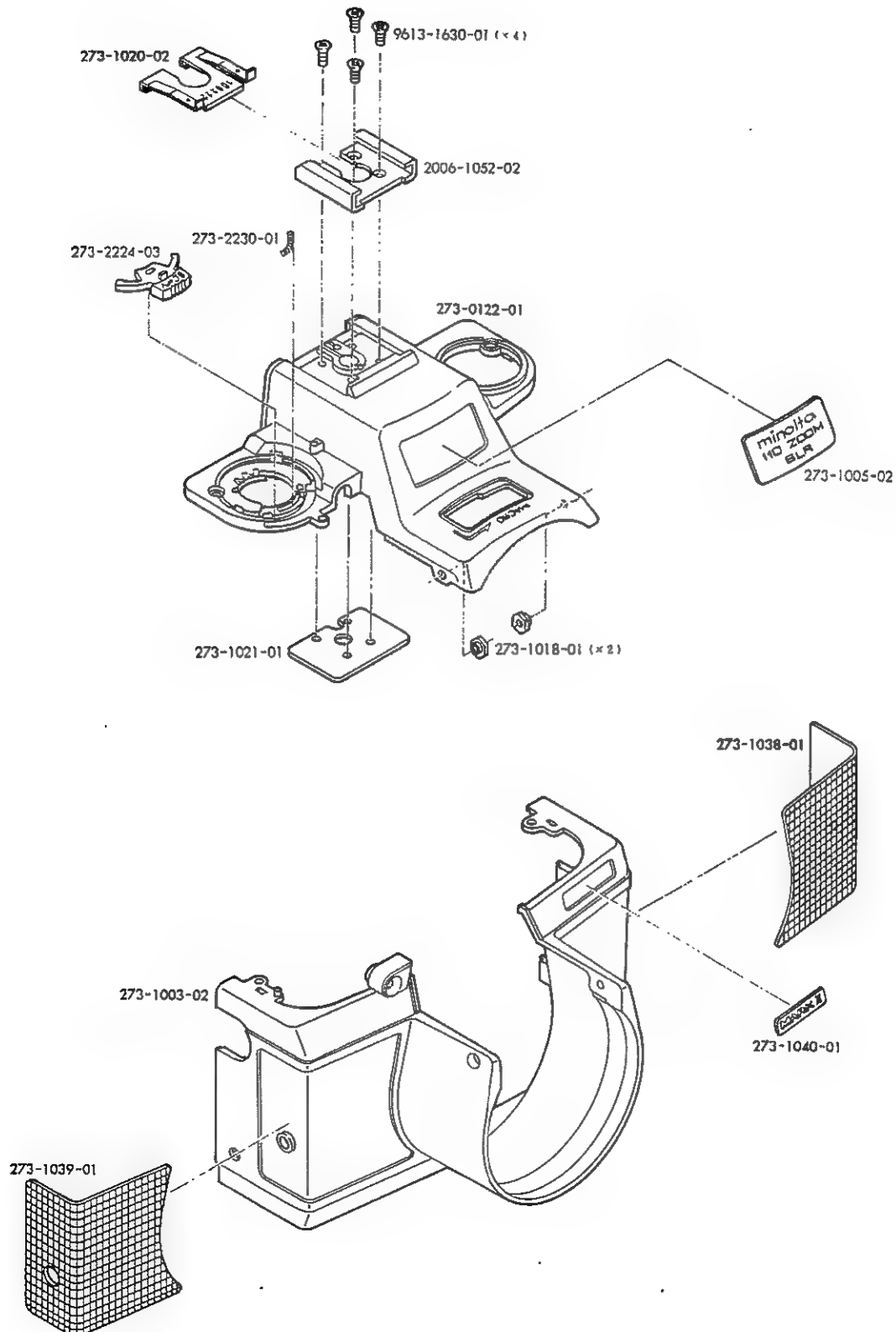
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273-0224-01	Shutter release button set レリーズ釦セット	1
273-0223-02	Shutter release button axis set レリーズ釦軸セット	1
273-2206-02	Shutter release button return spring レリーズ釦戻しSP	1
273-2207-03	Shutter release button pressure レリーズ釦押え	1
273-2208-02	Shutter release button base レリーズ釦座	1
273-2209-02	Shutter release button guide レリーズ釦ガイド	1
273-0320-01	Film advance lever set 巻上レバーセット	1
2006-0415-01	Battery holder set 電池ケース蓋セット	1
273-1014-02	Macro lens knob マクロ作動つまみ	1
273-1017-01	Tripod socket receiver 三脚受板	1
273-1029-01	Macro lens lock spring マクロロックばね	1
273-1035-02	Bottom cover 下カバー	1
168-3004-03	Film advance lever spring washer 巻上レバーSPワッシャー	1
273-3101-02	Film advance lever pressure 巻上レバー押え	1
273-4021-02	F-number dial 絞りダイヤル	1
273-4022-02	F-number scale 絞り表示ダイヤル	1
273-4024-02	Over-ride spring washer オーバーライドスプリングワッシャー	1
273-4034-01	F-number dial plate 絞り飾り板	1
253-9108-01	Screw 特殊ビス	1
273-9115-01	Screw 特殊ビス	10

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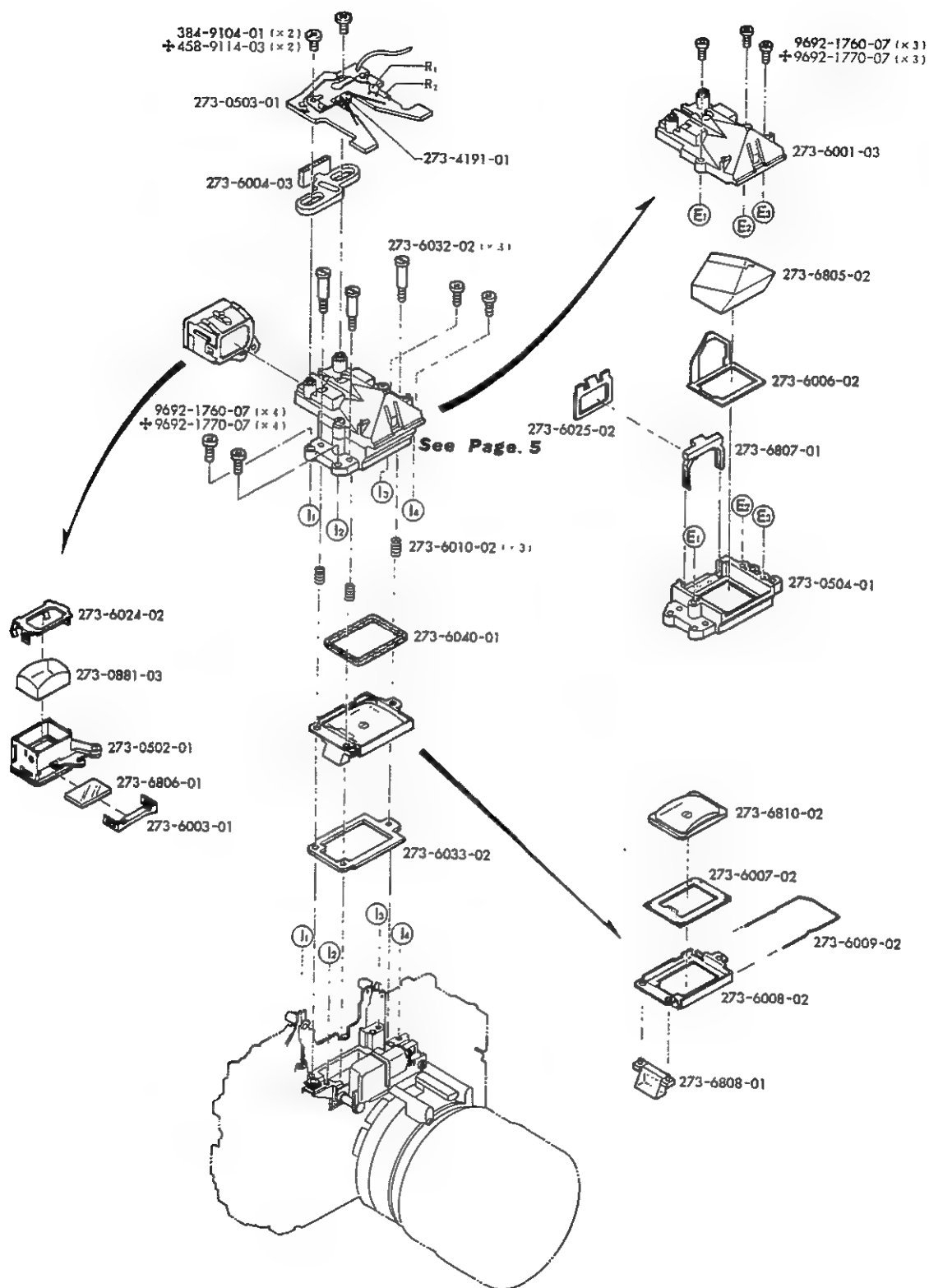
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273-0110-01	Back cover set 裏蓋セット	1
273-0112-01	Cover mount plate set カバー取付板セット	1
273-0180-01	Rear cover set 後カバーセット	1
273-1006-01	Eye piece shutter lever アイシャッター操作レバー	1
273-1007-02	Eye piece shutter change lever アイシャッター切換レバー	1
273-1008-01	Change lever pressure アイシャッター切換レバー押え	1
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273-1010-02	Strap hanger receiver-A 吊環受A	1
031-1027-02	Strap hanger ring 三角吊環	1
031-1034-02	Strap hanger ring stopper 三角環回り止め	1
273-1104-02	Hinge 裏蓋ヒンジ	1
273-1106-02	Hinge axis 裏蓋ヒンジ軸	1
273-1110-02	Back cover lock lever 裏蓋ロック爪	1
273-1111-01	Back cover lock spring 裏蓋ロックSP	1
253-9108-01	Screw 特殊ビス	1
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9691-2050-07	Phillips type tapping screw 十字穴付タッピンねじ	4
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273-0122-01	Top cover set 上カバーセット	1
273-1005-02	Name plate-A 上カバー銘板	1
273-1018-01	Nut 上カバー止めねじ受け	2
273-1021-01	Accessory shoe mount plate アクセサリーシュー取付板	1
2006-1052-02	Accessory shoe アクセサリーシュー	1
273-2224-03	Self-timer lever セルフレバー	1
273-2230-01	B.C operation spring B.C作動SP	1
9613-1630-01	Phillips type screw 十字穴付なべ頭小ねじ	4
273-1003-02	Front cover 正面カバー	1
273-1020-02	Accessory shoe spring アクセサリーシューばね	1
273-1038-01	Leather-A 正面貼皮A	1
273-1039-01	Leather-B 正面貼皮B	1
273-1040-01	Name plate-B 正面カバー銘板	1

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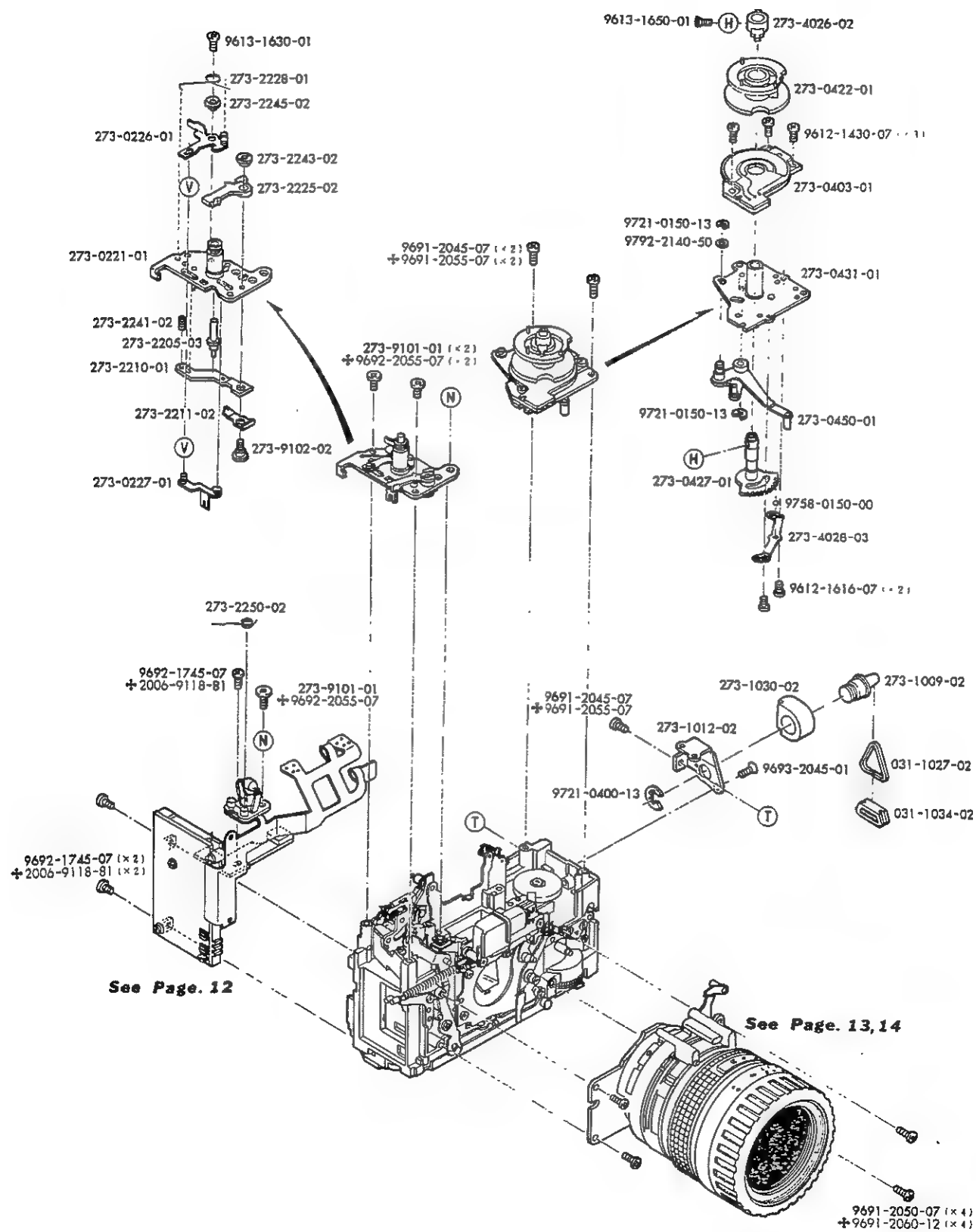
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Part No.	Part Name	Qty
部品番号	部品名称	員数
273-0502-01	Eyepiece holder set 接眼レンズホルダーセット	1
273-0503-01	CdS printed circuit plate set CdS基板セット	1
273-0504-01	Penta. prism holder set プリズムホルダーセット	1
273-0881-03	Eye piece set 接眼レンズセット	1
273-4191-01	CdS cell CdS	1
273-6001-03	Penta. prism pressure プリズム押え	1
273-6003-01	Protective glass receiver 保護ガラス受け	1
273-6004-03	Eyepiece corrector 視度調節レバー	1
273-6006-02	View finder frame 視野遮光枠	1
273-6007-02	View finder mask 視野マスク	1
273-6008-02	Fresnel lens holder 焦点板ホルダー	1
273-6009-02	Fresnel lens pressure 焦点板押えSP	1
273-6010-02	V <sub>B</sub> adjusting spring V <sub>B</sub> 調整SP	3
273-6024-02	Eyepiece light shield frame 接眼レンズ遮光枠	1
273-6025-02	Photometry prism shade plate 測光プリズム遮光板	1
273-6032-02	V <sub>B</sub> adjusting screw V <sub>B</sub> 調整ビス	3
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273-6040-01	View finder dustproof sponge ファインダー防塵片	1
273-6805-02	Pentagonal prism ペンタプリズム	1
273-6806-01	Protective glass 保護ガラス	1
273-6807-01	Photometry prism 測光プリズム	1
273-6808-01	L.E.D. reflector 光路棒	1
273-6810-02	Fresnel lens 焦点板	1
384-9104-01	Screw 特殊ビス	2
9692-1760-07	Phillips type tapping screw 十字穴付タッピンねじ	7
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	9431-2757-31 Adjusting resistor 2.7M $\Omega$ $\frac{1}{16}$ W	
	9431-3357-31 Adjusting resistor 3.3M $\Omega$ $\frac{1}{16}$ W	
	9431-3957-31 Adjusting resistor 3.9M $\Omega$ $\frac{1}{16}$ W	
	9431-4757-31 Adjusting resistor 4.7M $\Omega$ $\frac{1}{16}$ W	
	9431-5657-31 Adjusting resistor 5.6M $\Omega$ $\frac{1}{16}$ W	
	9431-6857-31 Adjusting resistor 6.8M $\Omega$ $\frac{1}{16}$ W	
R <sub>2</sub>	9422-2226-36 Adjusting resistor 2.2K $\Omega$ $\frac{1}{8}$ P	1
	9422-3326-36 Adjusting resistor 3.3K $\Omega$ $\frac{1}{8}$ P	
	9422-4326-36 Adjusting resistor 4.3K $\Omega$ $\frac{1}{8}$ P	
	9422-5626-36 Adjusting resistor 5.6K $\Omega$ $\frac{1}{8}$ P	
	9422-6826-36 Adjusting resistor 6.8K $\Omega$ $\frac{1}{8}$ P	
	9422-8226-36 Adjusting resistor 8.2K $\Omega$ $\frac{1}{8}$ P	
	9422-1036-36 Adjusting resistor 10K $\Omega$ $\frac{1}{8}$ P	
	9422-1236-36 Adjusting resistor 12K $\Omega$ $\frac{1}{8}$ P	
✦ 458-9114-03	Screw for damaged hole バカ穴補正ビス	2
✦ 9692-1770-07	Screw for damaged hole バカ穴補正ビス	7

# MINOLTA 110 ZOOM SLR MARK-II

CODE No. 0273

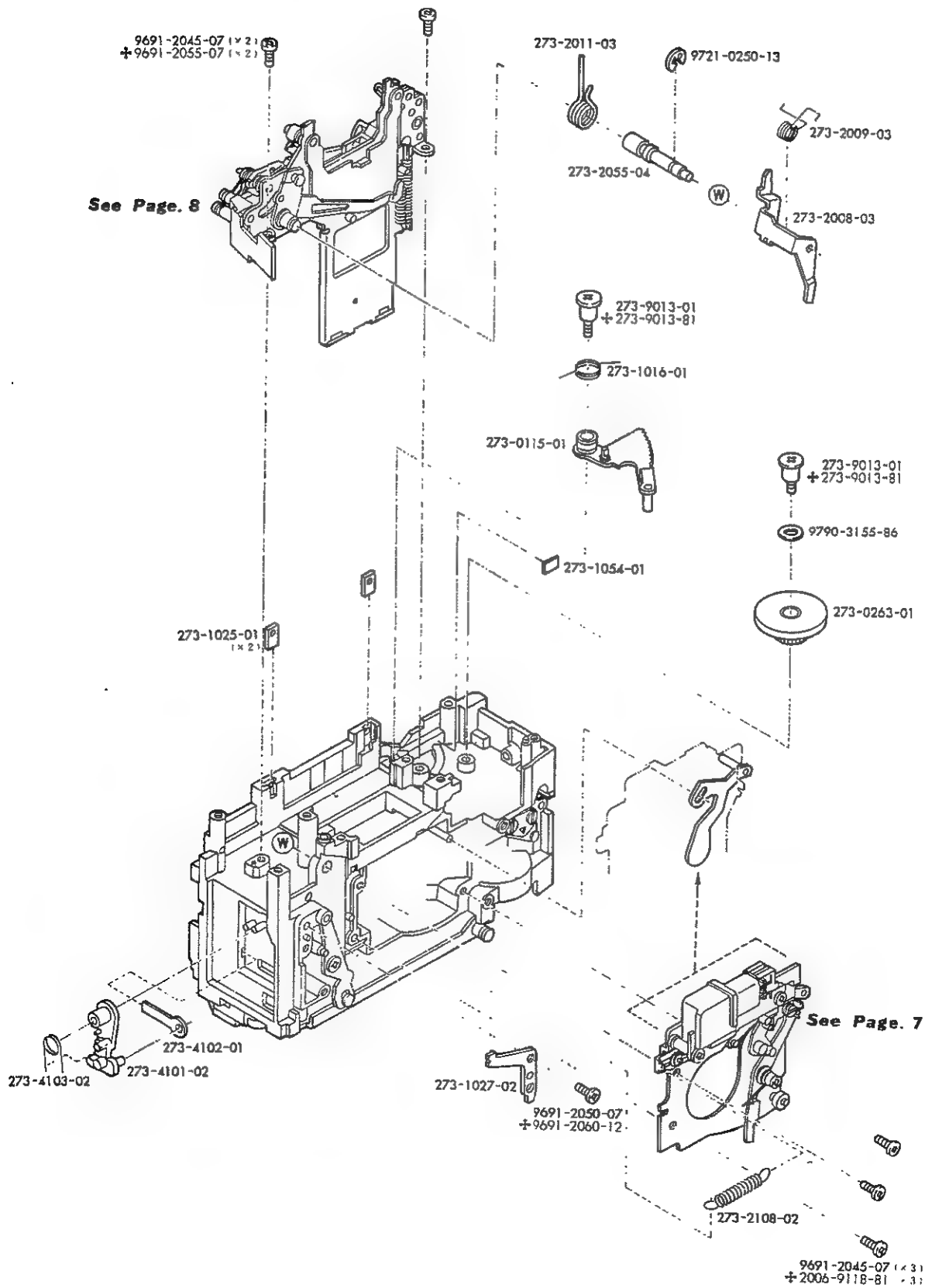




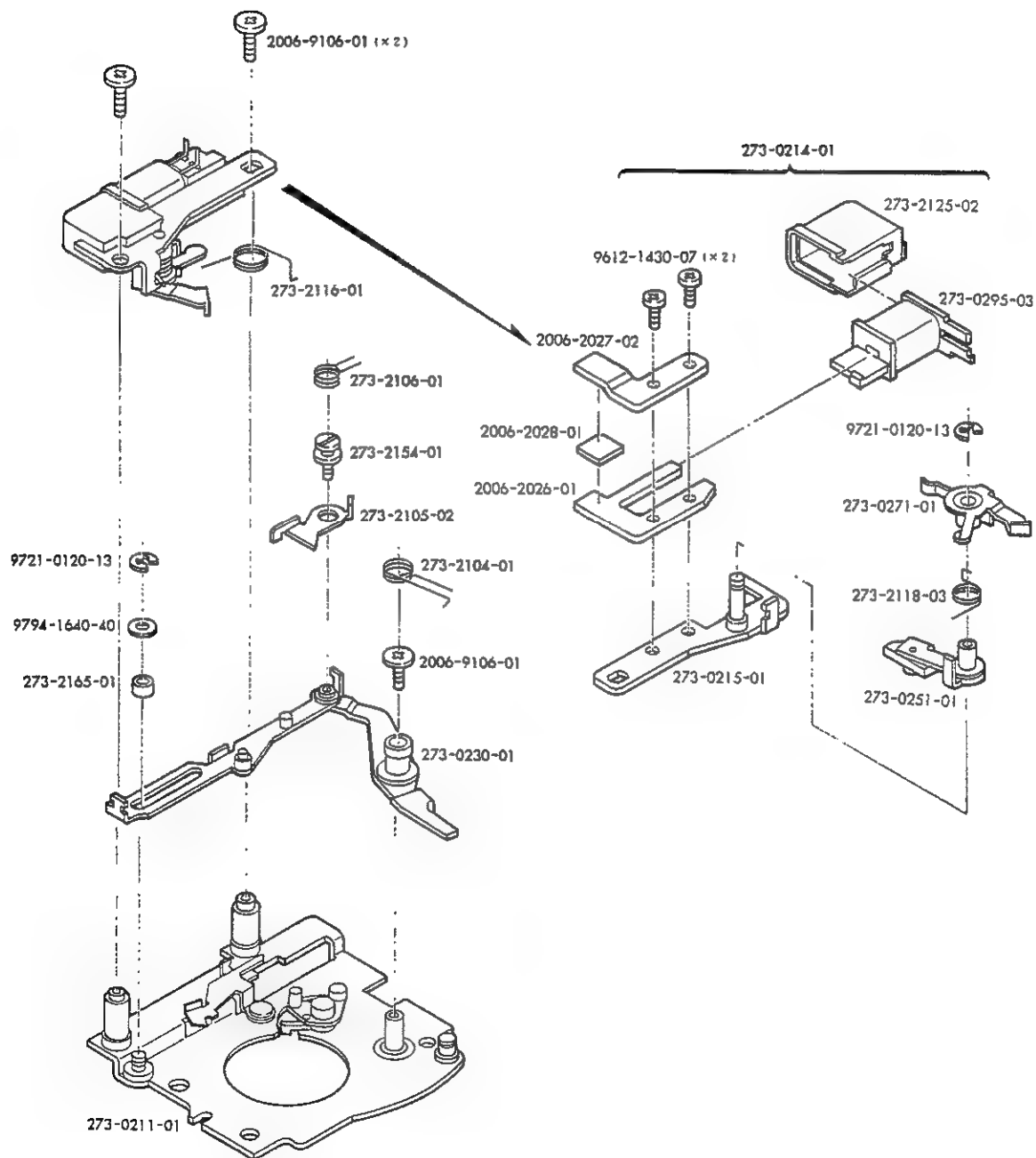
Part No.	Part Name	Qty
部品番号	部 品 名 称	員数
273-0221-01	Mode base plate set モード台板セット	1
273-0226-01	Mode change lever set モード切換レバーセット	1
273-0227-01	Mode transmission lever set モード伝達レバーセット	1
273-0403-01	Aperture setting circuit plate set 絞り基板セット	1
273-0422-01	Resistor contact set 絞り抵抗接片セット	1
273-0427-01	Aperture setting cam 絞りカムセット	1
273-0431-01	Aperture setting base plate set 絞りダイヤル台板セット	1
273-0450-01	Cam lever-B set 絞りカムレバーBセット	1
273-1009-02	Strap hanger 吊 環	1
273-1012-02	Cover mount plate-B カバー取付板B	1
031-1027-02	Strap hanger ring 三角吊環	1
273-1030-02	Strap hanger receiver-B 吊環受B	1
031-1034-02	Strap hanger ring stopper 三角環回り止め	1
273-2205-03	Release axis レリーズ芯	1
273-2210-01	Release lever レリーズ腕	1
273-2211-02	Release lever spring レリーズ腕SP	1
273-2225-02	Self-timer change cam セルフ切換カム	1
273-2228-01	Mode change lever spring モード切換レバーSP	1
273-2241-02	Release adjusting screw レリーズ調整ビス	1
273-2243-02	Release lever screw レリーズ腕止めビス	1
273-2245-02	Mode change lever axis モード切換レバー軸	1
273-2250-02	B.C contact B.C 接片	1
273-4026-02	Aperture connection plate 絞り連結板	1
273-4028-03	Aperture click spring 絞りクリックばね	1
273-9101-01	Mode base plate screw モード台板止めビス	3
273-9102-02	Screw 特殊ビス	1
9612-1430-07	Phillips type screw 十字穴付なべ頭小ねじ	3
9612-1616-07	Phillips type screw 十字穴付なべ頭小ねじ	2
9613-1630-01	Phillips type screw 十字穴付皿小ねじ	1
9613-1650-01	Phillips type screw 十字穴付皿小ねじ	1
9691-2045-07	Phillips type tapping screw 十字穴付タッピンねじ	3
9691-2050-07	Phillips type tapping screw 十字穴付タッピンねじ	4
9692-1745-07	Phillips type tapping screw 十字穴付タッピンねじ	3
9693-2045-01	Phillips type tapping screw 十字穴付タッピンねじ	1
9721-0150-13	E-ring Eリング	2
9721-0400-13	E-ring Eリング	1
9792-2140-50	Washer 薄ワッシャー	1
9758-0150-00	Steel ball スチールボール	1
+ 2006-9118-81	Screw for damaged hole バカ穴補正ビス	3
+ 9691-2055-07	Screw for damaged hole バカ穴補正ビス	3
+ 9691-2060-12	Screw for damaged hole バカ穴補正ビス	4
+ 9692-2055-07	Screw for damaged hole バカ穴補正ビス	3

# MINOLTA 110 ZOOM SLR MARK-II

## CODE No. 0273



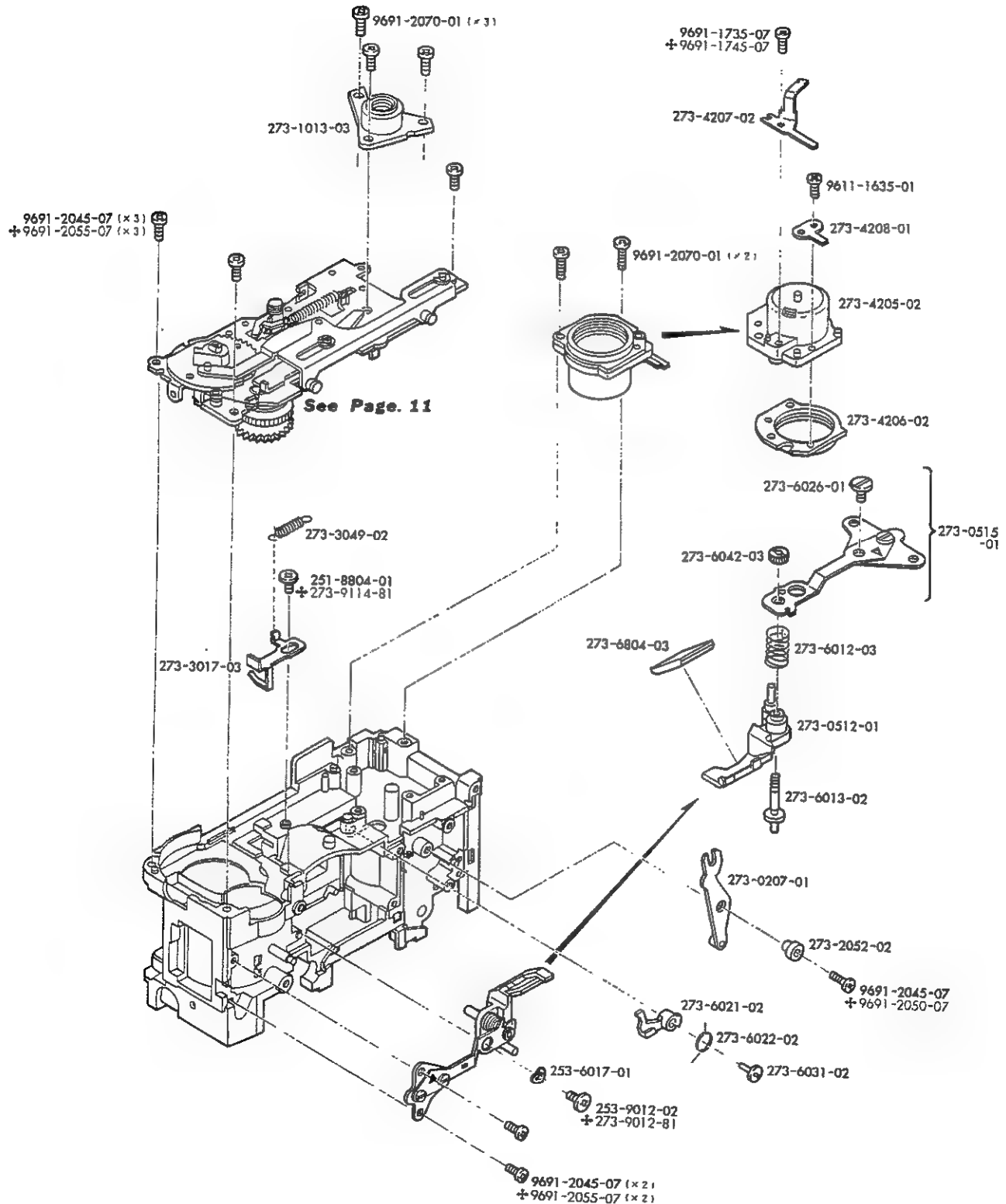
Part No., 部品番号	Part Name 部 品 名 称	Qty 員数
273-0115-01	Release connecting lever set レリーズ連動レバーセット	1
273-0263-01	Fly-wheel set フライホイールセット	1
273-1016-01	Release connecting lever spring レリーズ連動レバーSP	1
273-1025-01	Top cover set plate 上カバー止め板	2
273-1027-02	Release operation plate spring hanger レリーズ駆動板SP掛け	1
273-1054-01	Release connecting lever stopper レリーズ連動レバーストッパーゴム	1
273-2008-03	Shutter charge plate シャッターチャージねじれ板	1
273-2009-03	Shutter charge return spring シャッターチャージ戻しSP	1
273-2011-03	Over charge spring シャッターオーバーチャージSP	1
273-2055-04	Shutter charge axis シャッターチャージ軸	1
273-2108-02	Release operation plate spring レリーズ駆動板SP	1
273-4101-02	ASA change lever ASA切換レバー	1
273-4102-01	ASA detection lever ASA検知レバー	1
273-4103-02	ASA change lever spring ASA切換レバーSP	1
273-9013-01	Release connecting lever axis レリーズ連動レバー軸	2
9691-2045-07	Phillips type tapping screw 十字穴付タッピンねじ	5
9691-2050-07	Phillips type tapping screw 十字穴付タッピンねじ	1
9721-0250-13	E-ring Eリング	1
9790-3155-86	Washer 薄ワッシャー	1
✦ 273-9013-81	Screw for damaged hole バカ穴補正ビス	2
✦ 2006-9118-81	Screw for damaged hole バカ穴補正ビス	3
✦ 9691-2055-07	Screw for damaged hole バカ穴補正ビス	2
✦ 9691-2060-12	Screw for damaged hole バカ穴補正ビス	1

**MINOLTA 110 ZOOM SLR MARK-II****CODE No. 0273**

Part No. 部品番号	Part Name 部 品 名 称	Qty 員数
273-0211-01	Magnetic release base plate set レリーズ台板セット	1
273-0214-01	Release magnet set レリーズマグネットセット	1
273-0215-01	Magnet mount base plate set MAG取付台板セット	1
273-0251-01	Release magnet operation lever set レリーズMAG吸着片レバーセット	1
273-0271-01	Magnet release lever set レリーズ係止解除レバーセット	1
273-0295-03	Magnet coil set レリーズマグネットコイルセット	1
2006-2026-01	Magnet yolk レリーズMAGヨーク	1
2006-2027-02	Magnet pressure レリーズMAG押え板	1
2006-2028-01	Release magnet レリーズMAG磁石	1
273-2118-03	Magnet release lever spring レリーズ係止解除レバーSP	1
273-2125-02	Magnet coil cover レリーズ防塵カバー	1
9612-1430-07	Phillips type screw 十字穴付なべ頭小ねじ	2
9721-0120-13	E-ring Eリング	1
273-0230-01	Release operation plate set レリーズ駆動板セット	1
273-2104-01	Release operation lever spring レリーズ駆動レバーSP	1
273-2105-02	Mirror operation lever ミラー駆動レバー	1
273-2106-01	Mirror operation lever spring ミラー駆動レバーSP	1
273-2116-01	Operation plate stop lever spring 駆動板係止レバーSP	1
273-2154-01	Mirror operation lever screw ミラー駆動レバー止めビス	1
273-2165-01	Roller レリーズ駆動板ローラー	1
2006-9106-01	Screw 特殊ビス	3
9721-0120-13	E-ring Eリング	1
9794-1640-40	Washer 薄ワッシャー	1

# MINOLTA 110 ZOOM SLR MARK-II

CODE No. 0273

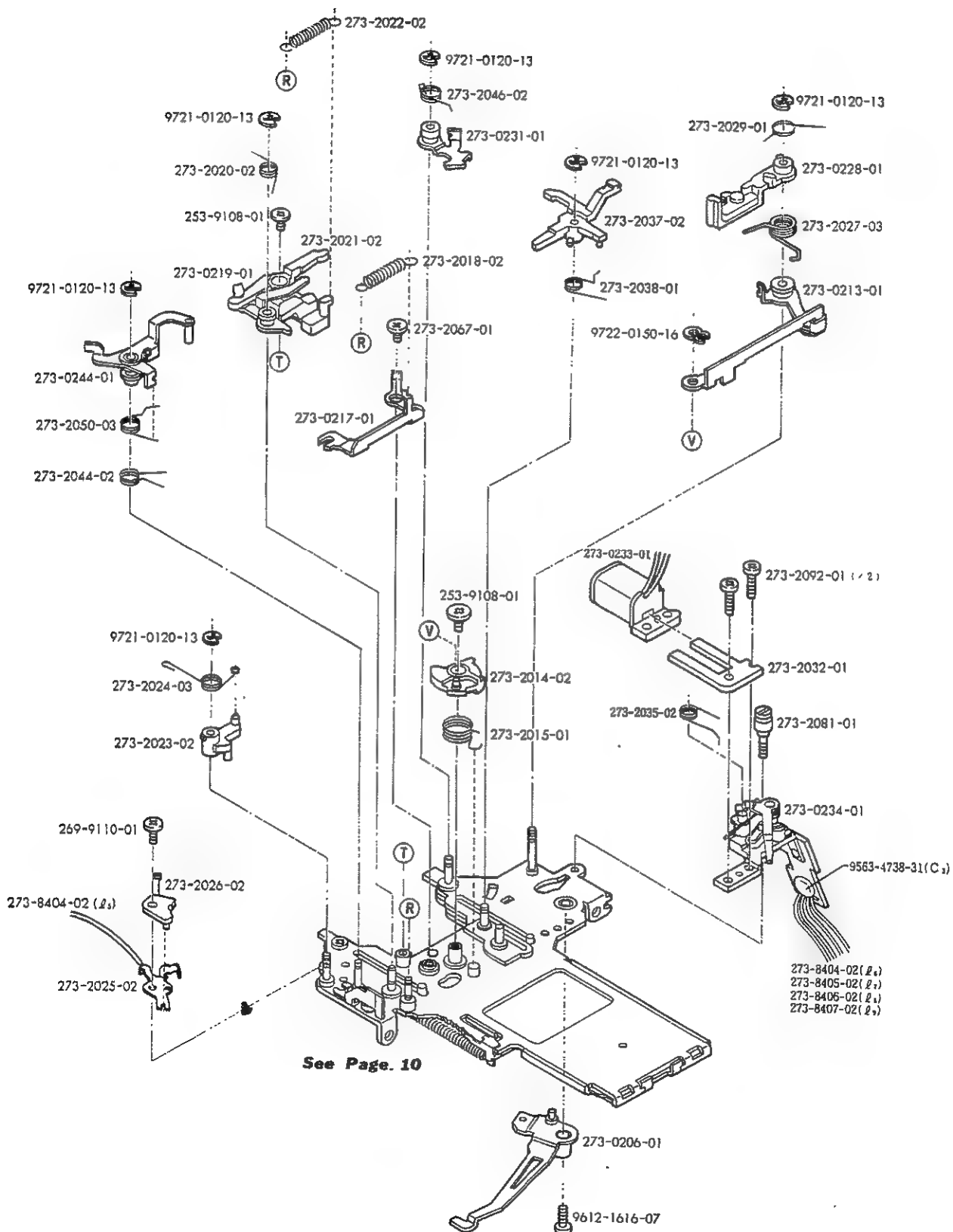


Part No. 部品番号	Part Name 部 品 名 称	Qty 員数
273-0207-01	Shutter charge transmission lever set シャッターチャージ伝達レバーセット	1
273-0512-01	Mirror holder set 可動ミラーホルダーセット	1
273-0515-01	Mirror adjusting plate set 可動ミラー調整板セット	1
273-6026-01	Mirror adjusting plate screw 可動ミラー調整板止ねじ	1
273-1013-03	Tripod socket 三脚ねじ	1
273-2052-02	Shutter charge transmission lever axis シャッターチャージ伝達レバー軸	1
273-3017-03	Perceive lever 触知レバー	1
273-3049-02	Perceive lever spring 触知レバーSP	1
273-4205-02	Battery case 電池ケース	1
273-4206-02	Battery case mount base 電池ケース取付台	1
273-4207-02	Battery ⊕ contact 電池ケース⊕接片	1
273-4208-01	Battery ⊖ contact 電池ケース⊖接片	1
273-6012-03	Mirror return spring 可動ミラー戻しSP	1
273-6013-02	Mirror holder axis 可動ミラーホルダー軸	1
253-6017-01	Washer 可動ミラー調整ワッシャー	1
273-6021-02	Mirror stop lever 可動ミラー係止レバー	1
273-6022-02	Mirror stop lever spring 可動ミラー係止レバーSP	1
273-6031-02	Mirror stop lever pin 可動ミラー係止レバー止め鉄	1
273-6042-03	Mirror adjusting nut 可動ミラー調整用ナット	1
273-6804-03	Mirror 可動ミラー	1
251-8804-01	Perceive lever screw 触知レバー止めねじ	1
253-9012-02	Mirror holder axis A 可動ミラーホルダー板軸A	1
9611-1635-01	Phillips type screw 十字穴付なべ頭小ねじ	1
9691-1735-07	Phillips type tapping screw 十字穴付タッピンねじ	1
9691-2045-07	Phillips type tapping screw 十字穴付タッピンねじ	6
9691-2070-01	Phillips type tapping screw 十字穴付タッピンねじ	5
✦ 273-9012-81	Screw for damaged hole バカ穴補正ビス	1
✦ 273-9114-81	Screw for damaged hole バカ穴補正ビス	1
✦ 9691-1745-07	Screw for damaged hole バカ穴補正ビス	1
✦ 9691-2050-07	Screw for damaged hole バカ穴補正ビス	1
✦ 9691-2055-07	Screw for damaged hole バカ穴補正ビス	5

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CODE No. 0273

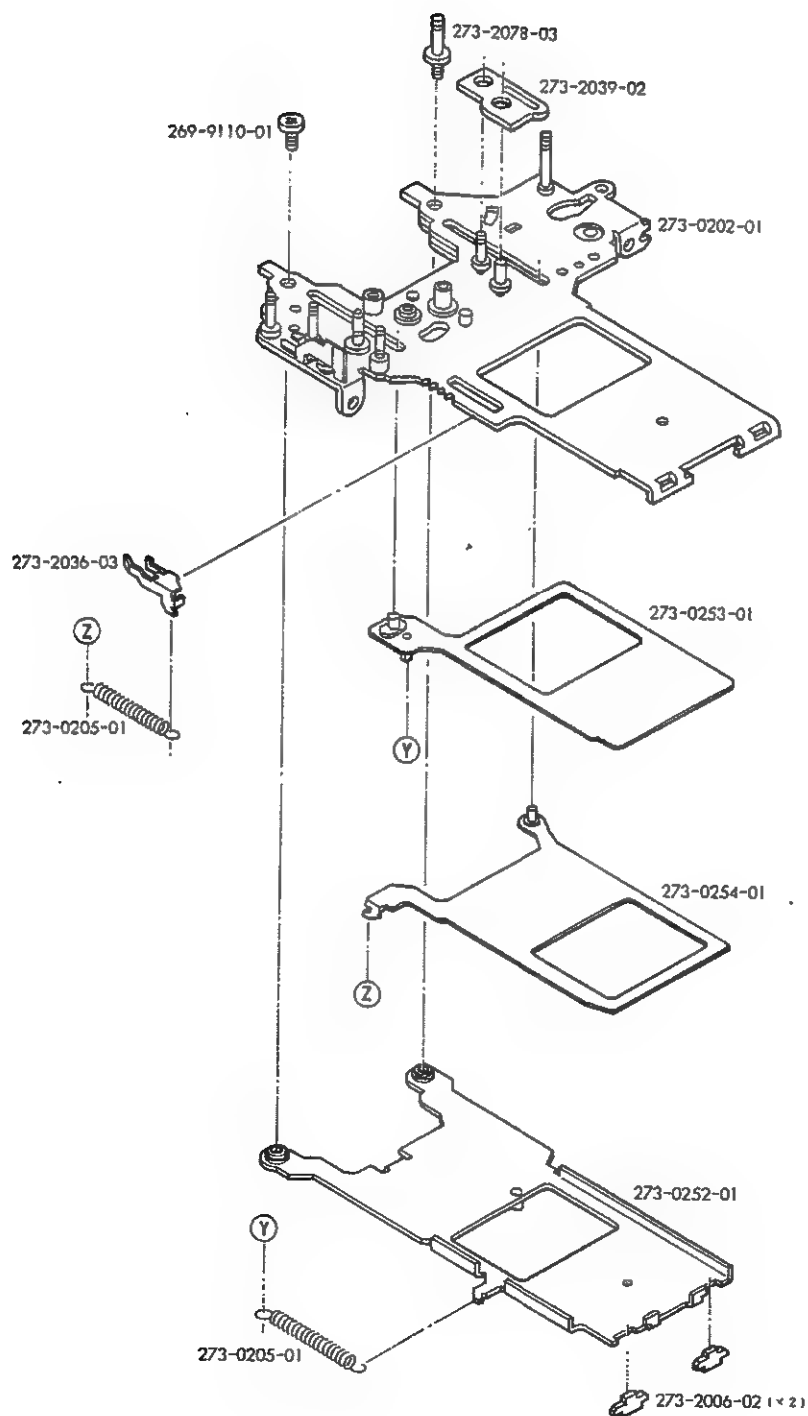
Assy. Part No. 273-0201-01





Part No.	Part Name	Qty
部品番号	部 品 名 称	員 数
273-0201-01	Shutter block シャッターブロック	1
273-0206-01	Shutter charge lever set シャッターチャージレバーセット	1
273-0213-01	Control lever set 制御レバーセット	1
273-0217-01	Shutter release lever set シャッターリリースレバーセット	1
273-0219-01	1st blade stop lever set 先羽根係止レバーセット	1
273-0228-01	Shutter magnet operation lever set 吸着片レバーセット	1
273-0231-01	2nd blade stop lever set 後羽根係止レバーセット	1
273-0234-01	Trigger SW base plate set トリガーSW台板セット	1
273-0233-01	Shutter magnet coil シャッターマグネットコイル	1
273-2035-02	Trigger SW トリガーSW	1
ℓ <sub>6</sub> 273-8404-02	Lead wire (Black φ0.08/7 wires ℓ=70mm) リード線 (黒)	1
ℓ <sub>7</sub> 273-8405-02	Lead wire (Orange φ0.08/7 wires ℓ=70mm) リード線 (橙)	1
ℓ <sub>8</sub> 273-8406-02	Lead wire (Blue φ0.08/7 wires ℓ=70mm) リード線 (青)	1
ℓ <sub>9</sub> 273-8407-02	Lead wire (White φ0.08/7 wires ℓ=70mm) リード線 (白)	1
C <sub>1</sub> 9563-4738-31	Condenser 0.047μF/12V	1
273-0244-01	Eye piece shutter operation lever set アイシャッター連動レバーセット	1
273-2014-02	Control cam 制御カム	1
273-2015-01	Control cam operation spring 制御カム駆動SP	1
273-2018-02	Release return spring リリース戻しSP	1
273-2020-02	1st blade stop lever spring 先羽根係止レバー戻しSP	1
273-2021-02	1st blade brake lever 先羽根ブレーキレバー	1
273-2022-02	1st blade brake spring 先羽根ブレーキSP	1
273-2023-02	Synchro lever シンクロレバー	1
273-2024-03	Synchro spring シンクロSP	1
273-2025-02	Synchro contact シンクロ接片	1
273-2026-02	Synchro pressure シンクロ押え板	1
273-2027-03	Adhesion plate over-charge spring 吸着片オーバーチャージSP	1
273-2029-01	Adhesion plate alienation spring 吸着片離反SP	1
273-2032-01	Shutter magnet core シャッターマグネット鉄芯	1
273-2037-02	Mechanical shutter lever 機械シャッターレバー	1
273-2038-01	Mechanical shutter lever return spring 機械シャッターレバー戻しSP	1
273-2044-02	Eye piece shutter operation lever spring アイシャッター連動レバーSP	1
273-2046-02	2nd blade stop lever spring 後羽根係止レバーSP	1
273-2050-03	Eye piece shutter over-charge spring アイシャッターオーバーチャージSP	1
273-2067-01	Control cam stop lever screw 制御カム係止レバー止めねじ	1
273-2081-01	Trigger SW base plate screw トリガーSW台板止めねじ	1
273-2092-01	Shutter magnet screw シャッターマグネット止めねじ	2
ℓ <sub>5</sub> 273-8404-02	Lead wire (Black φ0.08/7 wires ℓ=70mm) リード線 (黒)	1
253-9108-01	Screw 特殊ビス	2
269-9110-01	Screw 特殊ビス	1
9612-1616-07	Phillips type screw 十字穴付なべ頭小ねじ	1
9721-0120-13	E-ring Eリング	6
9722-0150-16	G-ring Gリング	1

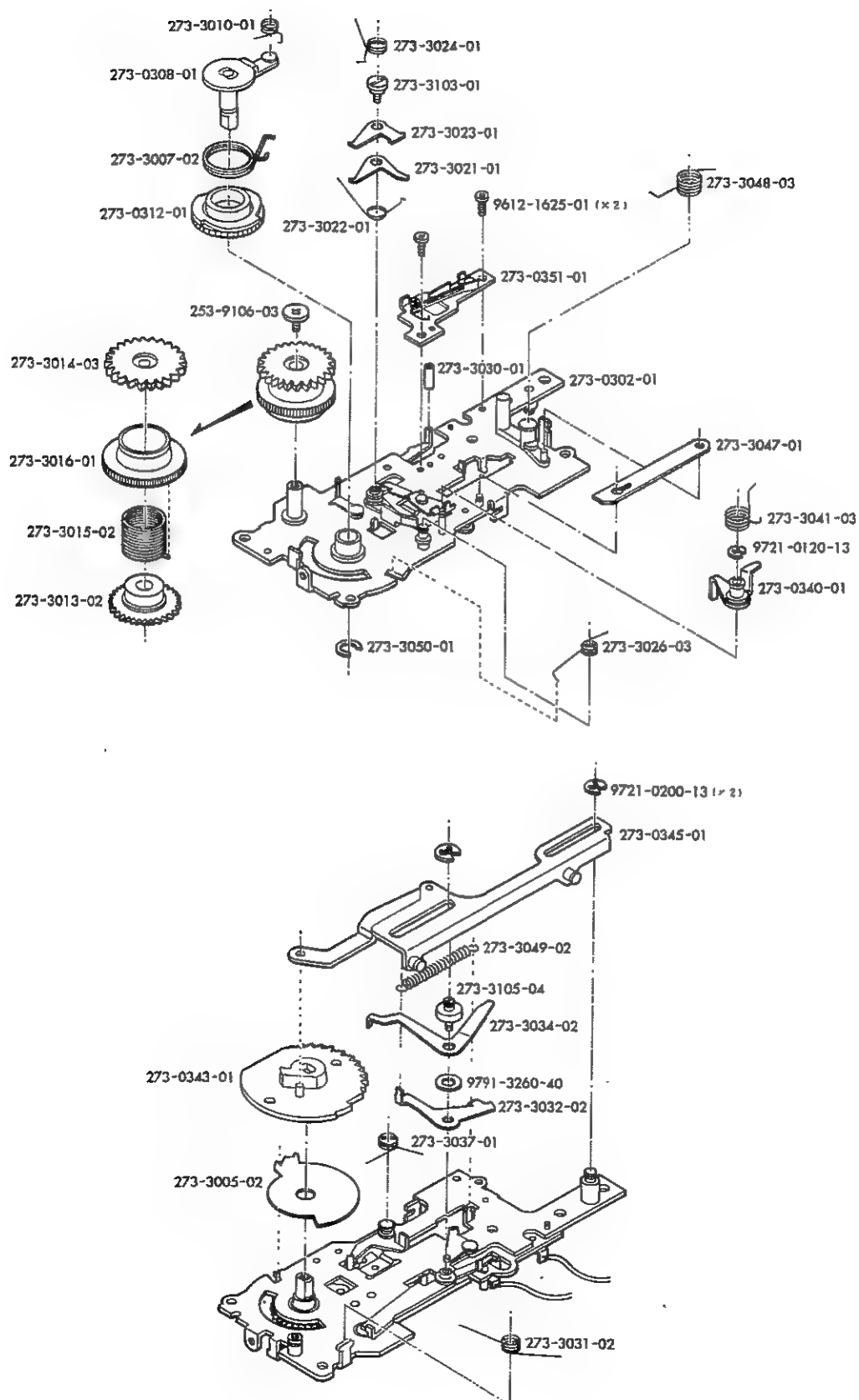
**MINOLTA 110 ZOOM SLR MARK-II**  
**CODE No. 0273**



Part No. 部品番号	Part Name 部 品 名 称	Qty 員数
273-0202-01	Shutter base plate set シャッター台板セット	1
273-0205-01	Shutter blade spring 羽根SP	2
273-0252-01	Shutter cover set シャッターカバー板セット	1
273-0253-01	1st blade set 先羽根セット	1
273-0254-01	2nd blade set 後羽根セット	1
273-2006-02	Shutter blade stopper 羽根ストッパー	2
273-2036-03	Exposure adjustment plate 露出ムラ調整板	1
273-2039-02	2nd blade brake 後羽根ブレーキ	1
273-2078-03	2nd blade stop lever axis 後羽根係止レバー軸	1
269-9110-01	Screw 特殊ビス	1

# MINOLTA 110 ZOOM SLR MARK-II

CODE No. 0273

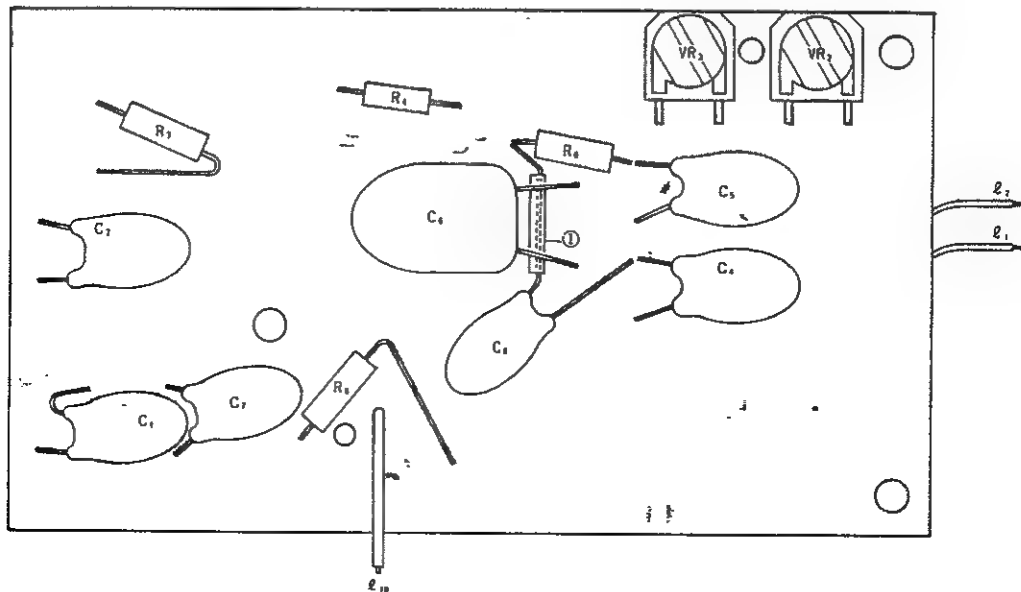
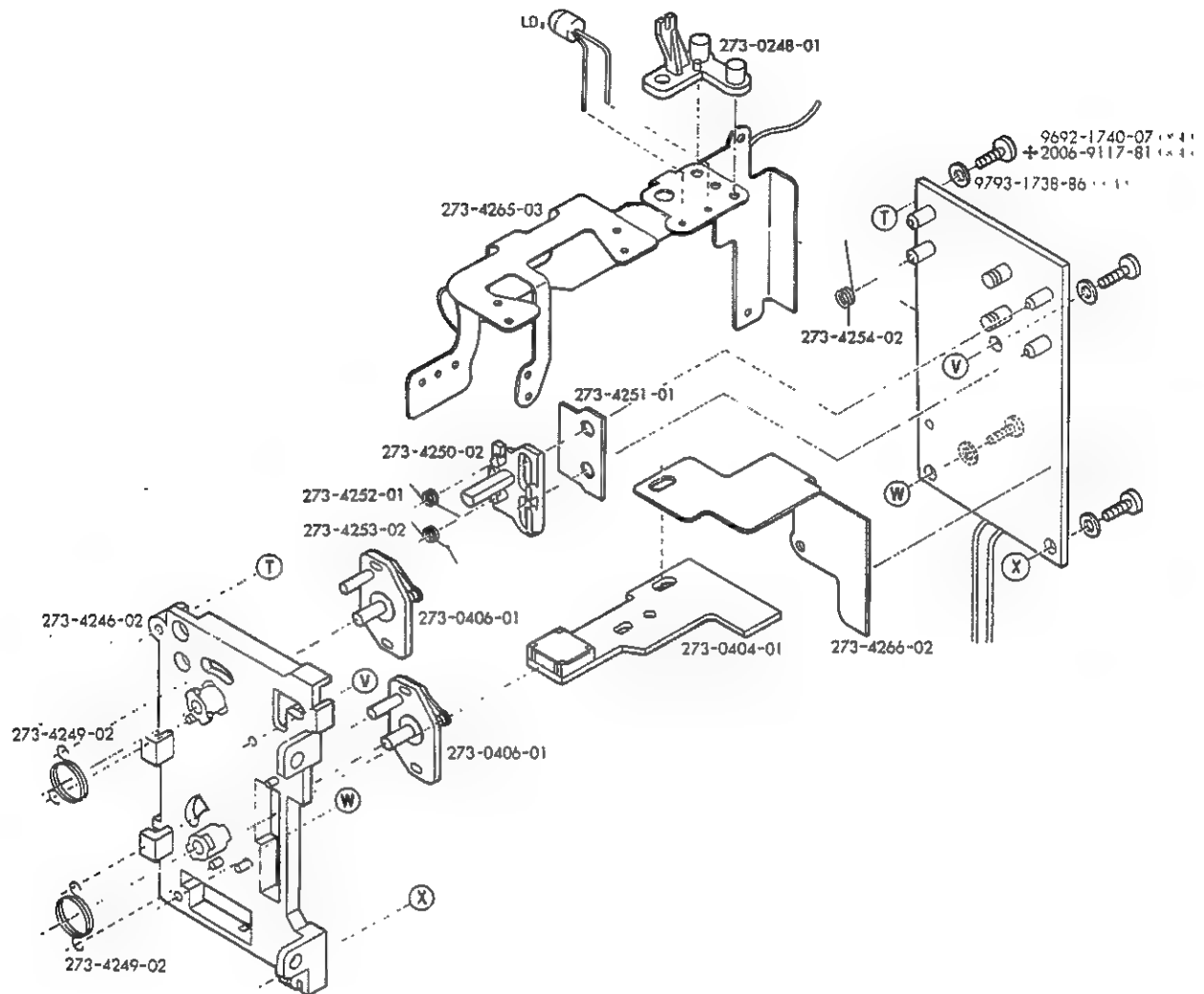


Part No. 部品番号	Part Name 部品名称	Qty 良数
273-0302-01	Winding base plate set 巻上台板セット	1
273-0308-01	Winding feed plate set 巻上送り板セット	1
273-0312-01	Winding gear-A set 巻上ギヤーAセット	1
273-0340-01	Perceive release lever set 触知解除レバーセット	1
273-0343-01	Charge turning plate set チャージ回転板セット	1
273-0345-01	Charge plate set チャージ板セット	1
273-0351-01	S <sub>4</sub> base plate set S <sub>4</sub> 台板セット	1
273-3005-02	Reversing stop release plate 逆転防止解除板	1
273-3007-02	Winding lever return spring 巻上レバー戻しSP	1
273-3010-01	Feed claw spring 送り爪SP	1
273-3013-02	Winding gear-B 巻上ギヤーB	1
273-3014-03	Winding gear 巻取ギヤー	1
273-3015-02	Winding gear connection spring ギヤー連結SP	1
273-3016-01	Winding stop gear 巻止め車	1
273-3021-01	Winding stop claw-B 巻止め爪B	1
273-3022-01	Winding stop claw-B spring 巻止め爪B SP	1
273-3023-01	Winding stop claw-C 巻止め爪C	1
273-3024-01	Winding stop claw-C spring 巻止め爪C SP	1
273-3026-03	Reversing stop spring 逆転防止SP	1
273-3030-01	Winding stop lever isolation tube 巻止めレバー絶縁チューブ	1
273-3031-02	Winding stop lever spring 巻止めレバーSP	1
273-3032-02	Winding set plate 巻上セット補助板	1
273-3034-02	Winding set lever 巻上セットレバー	1
273-3037-01	Winding set lever spring 巻上セットレバー係止爪SP	1
273-3041-03	Perceive release lever spring 触知解除レバーSP	1
273-3047-01	Cartridge sensor-B カートリッジセンサーB	1
273-3048-03	Cartridge sensor spring カートリッジセンサーSP	1
273-3049-02	Winding set plate spring 巻上セット補助板SP	1
273-3050-01	Stopper ring 巻上レバー軸抜け止めリング	1
273-3103-01	Winding stop claw screw 巻止め爪ビス	1
273-3105-04	Charge plate axis-A シャッターチャージ板軸A	1
253-9106-03	Winding gear screw 巻取ギヤー止めねじ	1
9612-1625-01	Phillips type screw 十字穴付なべ頭小ねじ	2
9721-0120-13	E-ring Eリング	1
9721-0200-13	E-ring Eリング	2
9791-3260-40	Washer 薄ワッシャー	1

# MINOLTA 110 ZOOM SLR MARK-II

CODE No. 0273

Assy. Part. No. 273-0401-01



Assy. Part No. 273-0401-01 Assy. Part Name: Printed circuit plate set

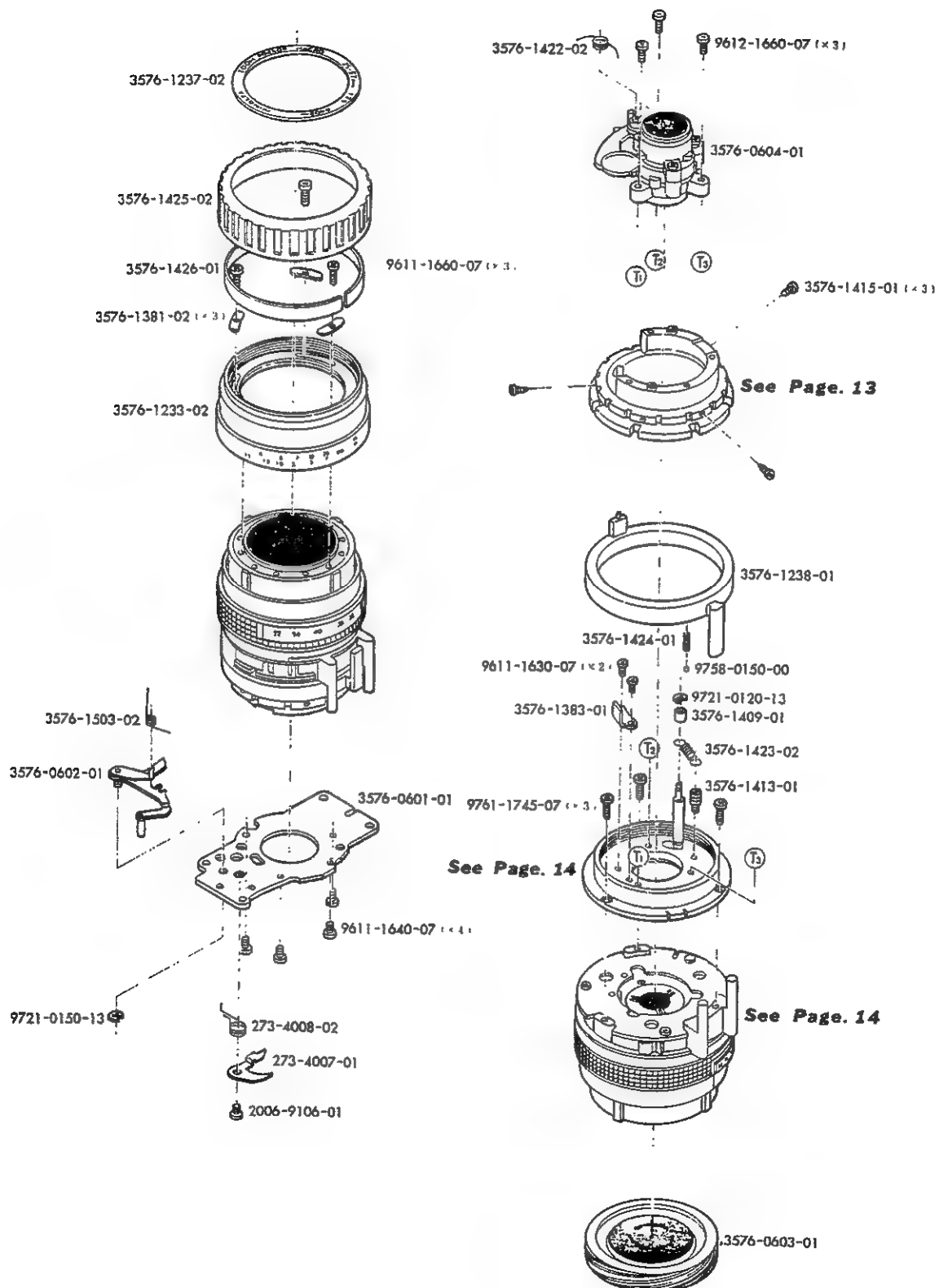
メイン基板セット

Symbol	Part No.	Com.	Part Name	Typ.	Qty.
LD <sub>9</sub>	9353-2641-01		L.E.D.	TLR-102	1
R <sub>3</sub>	9433-1036-34		Resistor	$\frac{1}{8}$ W 10K $\Omega$	1
R <sub>4</sub>	9421-2036-32			$\frac{1}{8}$ W 20K $\Omega$	1
	9421-2236-32			$\frac{1}{8}$ W 22K $\Omega$	
	9421-2436-32			$\frac{1}{8}$ W 24K $\Omega$	
	9421-2736-32			$\frac{1}{8}$ W 27K $\Omega$	
	9421-3036-32			$\frac{1}{8}$ W 30K $\Omega$	
	9421-3336-32			$\frac{1}{8}$ W 33K $\Omega$	
	9421-3936-32			$\frac{1}{8}$ W 39K $\Omega$	
	9421-4736-32			$\frac{1}{8}$ W 47K $\Omega$	
	9421-5636-32			$\frac{1}{8}$ W 56K $\Omega$	
	9421-6836-32			$\frac{1}{8}$ W 68K $\Omega$	
	9421-1046-32			$\frac{1}{8}$ W 100K $\Omega$	
	9421-2046-32			$\frac{1}{8}$ W 200K $\Omega$	
R <sub>6</sub>	9421-3046-32			$\frac{1}{8}$ W 300K $\Omega$	1
R <sub>8</sub>	9421-3916-32			$\frac{1}{8}$ W 390 $\Omega$	1
	9421-8216-32			$\frac{1}{8}$ W 820 $\Omega$	
	9421-1826-32			$\frac{1}{8}$ W 1.8K $\Omega$	
	9421-3326-32			$\frac{1}{8}$ W 3.3K $\Omega$	
C <sub>1</sub> C <sub>7</sub>	9535-1555-36		Condenser	1.5 $\mu$ F/35V	2
C <sub>2</sub> C <sub>8</sub>	9535-6845-36			0.68 $\mu$ F/35V	2
C <sub>4</sub>	9531-2265-61			22 $\mu$ F/3.15V	1
C <sub>5</sub>	9531-4765-61			47 $\mu$ F/3.15V	1
C <sub>6</sub>	9531-1575-61			150 $\mu$ F/3.15V	1
VR <sub>2</sub> VR <sub>3</sub>	9472-1539-41		Variable resistor	VG042TK 15KW	2
$\ell_1$	273-8401-02		Red	$\phi$ 0.08/7 wires $\ell$ = 50mm	1
$\ell_2$	273-8402-02		Lead wire Black	$\phi$ 0.08/7 wires $\ell$ = 50mm	1
$\ell_{10}$	273-8408-02		Pink	$\phi$ 0.08/7 wires $\ell$ = 40mm	1
①	273-4258-01		Isolation tube		1
273-0404-01	LED printed circuit plate set	LED基板セット			1
273-0406-01	Change over contact holder set	切換接片ホルダーセット			2
273-4246-02	Printed circuit plate holder	メイン基板ホルダー			1
273-4249-02	Change over spring	切換SP			2
273-4250-02	Release contact holder	リリース接片ホルダー			1
273-4251-01	Contact holder plate	接片ホルダー敷板			1
273-4252-01	Photometry switch contact	測光SW接片			1
273-4253-02	Release switch contact	リリースSW接片			1
273-4254-02	Self-timer switch contact	セルフSW接片			1
273-4265-03	Flexible printed circuit plate-A	フレキシブル基板A			1
273-4266-02	Flexible printed circuit plate-B	フレキシブル基板B			1
9692-1740-07	Phillips type tapping screw	十字穴付タッピンねじ			4
9793-1738-86	Washer	薄ワッシャー			4

Part No.	Part Name	Qty
部品番号	部品名称	数量
273-0248-01	B.C base set B.Cベースセット	1
✦ 2006-9117-81	Screw for damaged hole バカ穴補正ビス	4

# MINOLTA 110 ZOOM SLR MARK-II

CODE No. 0273

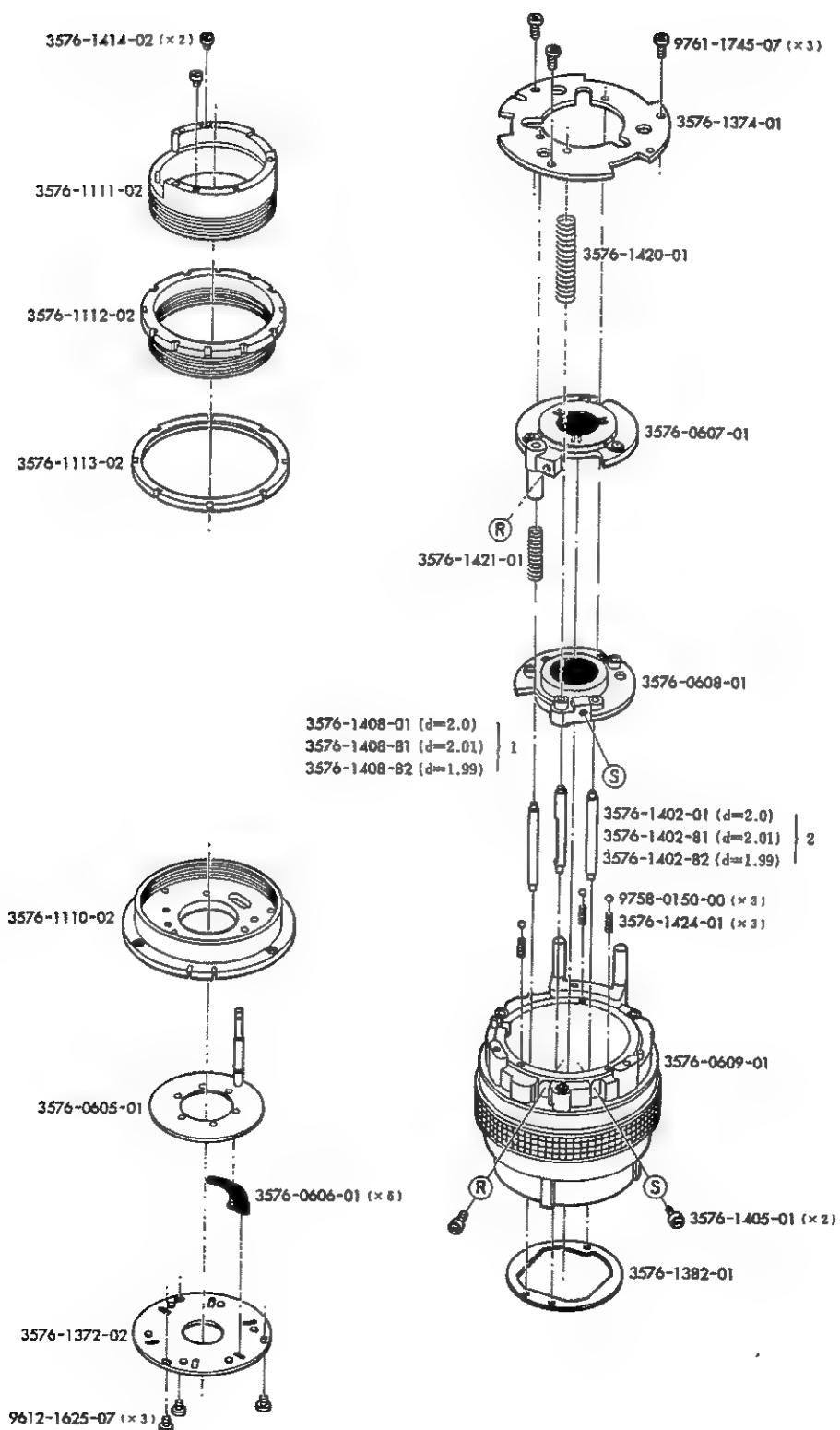




Part No.	Part Name	Qty
部品番号	部 品 名 称	員数
3576-0601-01	Zoom lens base plate set 鏡胴台板セット	1
3576-0602-01	Diaphragm operation lever set 絞り運動レバーセット	1
3576-0603-01	Focus lens barrel set フォーカス玉枠セット	1
3576-0604-01	Master lens barrel set マスターレンズ枠セット	1
3576-1233-02	Distance scale ring 距離環	1
3576-1237-02	Name ring 絞り環	1
3576-1238-01	Macro lens ring マクロ中継リング	1
3576-1381-02	Distance scale ring set plate 距離環締付板	3
3576-1383-01	Helicoid key 直進キー	1
3576-1409-01	Diaphragm operation pin collar 絞り操作ピンカラー	1
3576-1413-01	Diaphragm spring hanger 絞りスプリング掛け	1
3576-1415-01	Back adjusting nut screw バック調整ビス	3
3576-1422-02	Macro lens spring マクロ用スプリング	1
3576-1423-02	Diaphragm spring 絞りスプリング	1
3576-1424-01	Click spring クリックスプリング	1
3576-1425-02	Rubber ring 距離環ゴムリング	1
3576-1426-01	Tape ゴムリング接着テープ	1
3576-1503-02	Diaphragm operation lever spring 絞り運動レバーSP	1
273-4007-01	Pre-set cam 絞りプリセットカム	1
273-4008-02	Pre-set spring 絞りプリセットSP	1
2006-9106-01	Screw 特殊ビス	1
9611-1630-07	Phillips type screw 十字穴付なべ頭小ねじ	2
9611-1640-07	Phillips type screw 十字穴付なべ頭小ねじ	4
9611-1660-07	Phillips type screw 十字穴付なべ頭小ねじ	3
9612-1660-07	Phillips type screw 十字穴付なべ頭小ねじ	3
9761-1745-07	Tap tight screw タップタイトねじ	3
9721-0120-13	E-ring Eリング	1
9721-0150-13	E-ring Eリング	1
9758-0150-00	Steel ball スチールボール	1

# MINOLTA 110 ZOOM SLR MARK-II

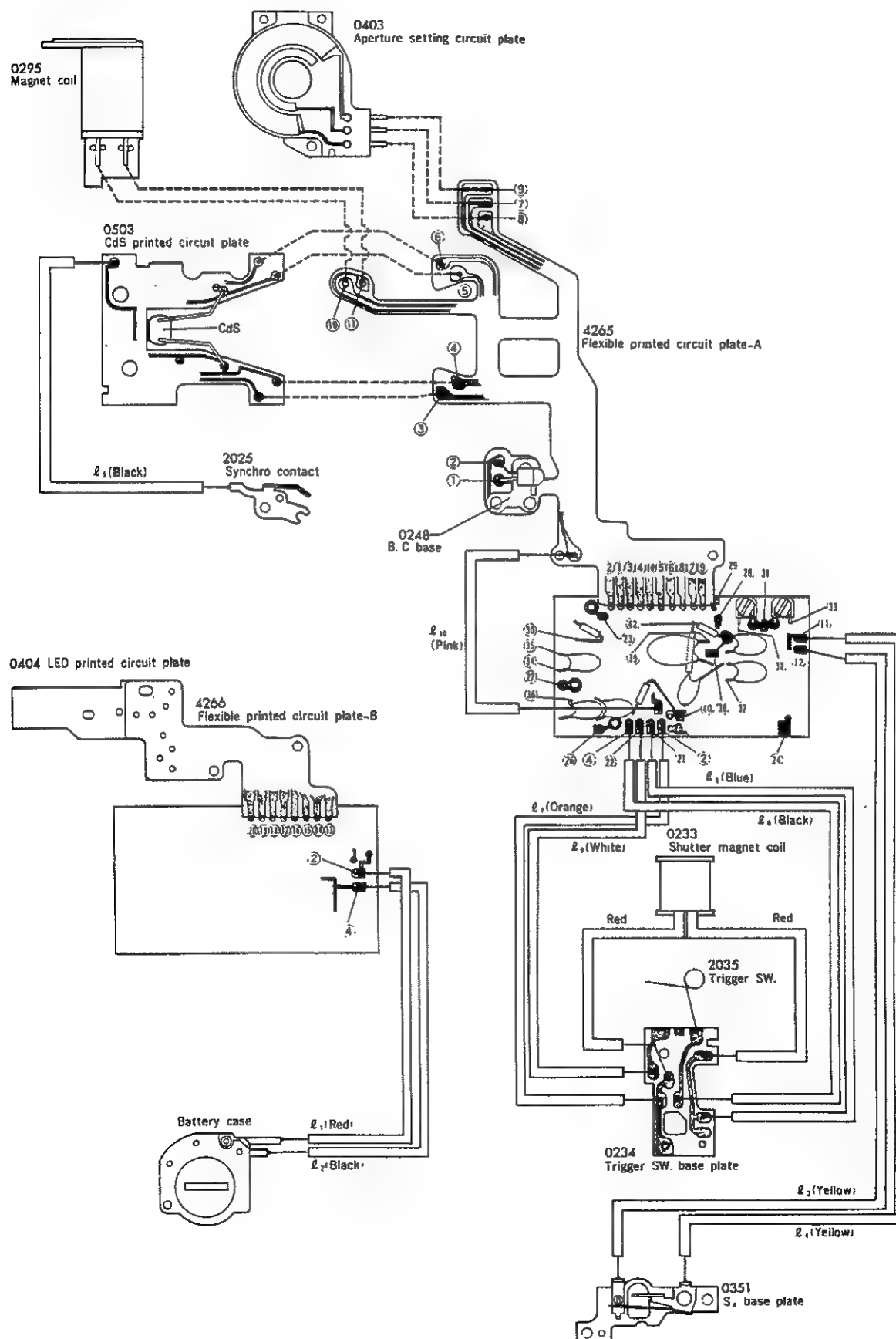
CODE No. 0273



Part No.	Part Name	Qty
部品番号	部 品 名 称	員数
3576-0605-01	Diaphragm operation plate set 絞り操作板セット	1
3576-0606-01	Diaphragm blade set 絞り羽根セット	6
3576-0607-01	2nd moving barrel set 第2移動棒セット	1
3576-0608-01	1st moving barrel set 第1移動棒セット	1
3576-0609-01	Cam barrel set カム筒セット	1
3576-1110-02	Inner barrel-A 内筒A	1
3576-1111-02	Inner barrel-B 内筒B	1
3576-1112-02	Back adjusting nut-A バック調整用ナットA	1
3576-1113-02	Back adjusting nut-B バック調整用ナットB	1
3576-1372-02	Diaphragm blade pressure 絞り押え板	1
3576-1374-01	Zoom lens base plate ズーム台板	1
3576-1382-01	Front light shield plate 前遮光板	1
3576-1402-01	Moving lens guide bar-A (d=2.0) 移動レンズガイドバーA(d=2.0)	2
3576-1402-81	Moving lens guide bar-A (d=2.01) 移動レンズガイドバーA(d=2.01)	
3576-1402-82	Moving lens guide bar-A (d=1.99) 移動レンズガイドバーA(d=1.99)	
3576-1405-01	Moving lens guide pin 移動レンズ操作ピン	2
3576-1408-01	Moving lens guide bar-B (d=2.0) 移動レンズガイドバーB(d=2.0)	1
3576-1408-81	Moving lens guide bar-B (d=2.01) 移動レンズガイドバーB(d=2.01)	
3576-1408-82	Moving lens guide bar-B (d=1.99) 移動レンズガイドバーB(d=1.99)	
3576-1414-02	Set position pin 位置決めピン	2
3576-1420-01	1st moving lens pressure spring 第1移動レンズ用圧着SP	1
3576-1421-01	2nd moving lens pressure spring 第2移動レンズ用圧着SP	1
3576-1424-01	Click spring クリックスプリング	3
9612-1625-07	Phillips type screw 十字穴付なべ頭小ねじ	3
9761-1745-07	Tap tight screw タップタイトねじ	3
9758-0150-00	Steel ball スチールボール	3

# MINOLTA 110 ZOOM SLR MARK-II

CODE No. 0273



## Lead wires list

Symbol	Part No.	Color	Typ.	Qty.
$\ell_1$	273-8401-02	Red	$\phi 0.08/7$ wires $\ell = 50$ mm	1
$\ell_2$	273-8402-02	Black	$\phi 0.08/7$ wires $\ell = 50$ mm	1
$\ell_3 \ell_4$	273-8403-02	Yellow	$\phi 0.08/7$ wires $\ell = 80$ mm	2
$\ell_5 \ell_6$	273-8404-02	Black	$\phi 0.08/7$ wires $\ell = 70$ mm	2
$\ell_7$	273-8405-02	Orange	$\phi 0.08/7$ wires $\ell = 70$ mm	1
$\ell_8$	273-8406-02	Blue	$\phi 0.08/7$ wires $\ell = 70$ mm	1
$\ell_9$	273-8407-02	White	$\phi 0.08/7$ wires $\ell = 70$ mm	1
$\ell_{10}$	273-8408-02	Pink	$\phi 0.08/7$ wires $\ell = 40$ mm	1

# Disassembly, Assembly and Adjustment

■ The contents of this manual are mainly based upon the assembly and adjustment procedure of model 273.

■ Reversely follow the pages when using this manual for the purpose of disassembly because the procedure is arranged for assembly.

■ Description of symbol marks

- **G** : Grease used and parts greased
- **B** : Adhesives used and parts glued
- **T** : Tool used and tool No.

■ Assembly and adjustment procedure	Page
1. Winding base plate and mirror holder .....	1
2. Release base plate and shutter .....	2
■ Mirror stop timing adjustment .....	3
3. Lens block, aperture dial base plate, circuit plate and mode base plate .....	4
4. Finder .....	7
■ Checking release stroke .....	8, 33
■ Focus adjustment .....	9
■ Finder back adjustment .....	10
■ Checking finder image .....	11
■ Check and adjustment of LED vision .....	12
■ Aperture diameter adjustment .....	13
■ EE adjustment-1.....CdS resistance value measurement (Selection of R <sub>1</sub> and R <sub>2</sub> ) .....	14
■ EE adjustment-2.....180mV adjustment (Selection of R <sub>4</sub> ) .....	15
■ EE adjustment-3.....EE level adjustment (Adjustment of VR <sub>2</sub> , S <sub>2</sub> ) .....	16
■ Adjustment of LED indication .....	17
■ Synchro check and, check of B.C voltage, etc. ....	18
5. 6 Outer casing (Camera completed) .....	19 20

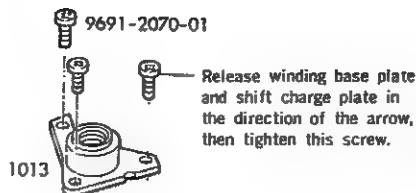
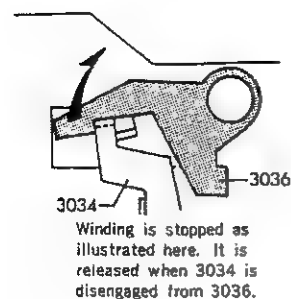
■ Assembly and adjustment of each block	
■ Assembly of winding base plate .....	21 22
■ S <sub>1</sub> adjustment .....	22
■ Release base plate assembly .....	23
■ Magnet power checking .....	24 26
■ Shutter assembly .....	27 28
■ Shutter block performance checking .....	29
■ Aperture base plate and mode base plate assembly .....	30
■ Circuit plate assembly .....	31 32
■ Lens block assembly .....	34
■ Top cover and front cover assembly .....	
■ Measuring instruments and others .....	35
■ Circuit diagram and wiring schematic diagram .....	36 37
■ Precautions	

Since a lot of resin parts are used for 273, take the following precautions for their assembly and adjustment.

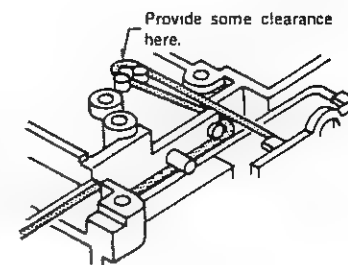
1. When cleaning, use Flonsolve or alcohol. Do not use thinner, Ketone, ether or the like.
2. Use the specified set-screw for fitting each part. Each set-screw should be correctly tightened.
3. When screw threads are defective, use the specified screws. (Refer to Parts List.)

# I Winding base plate and mirror holder

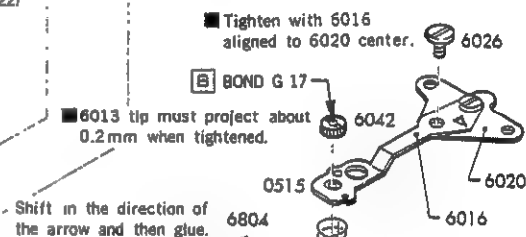
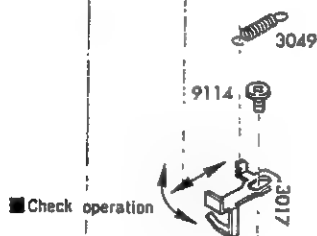
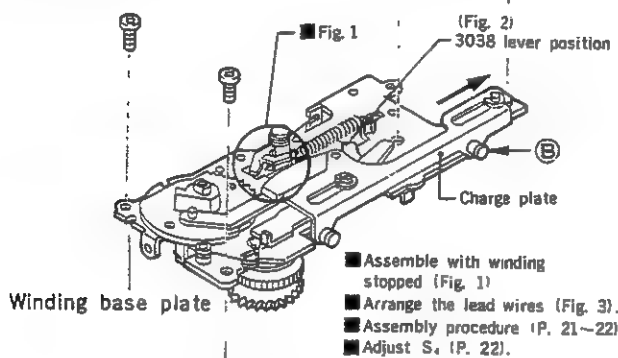
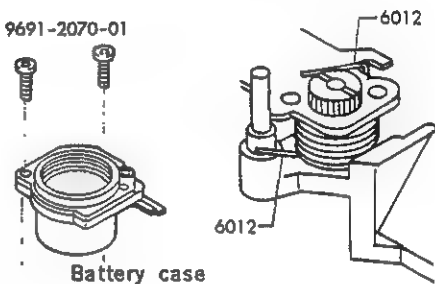
■ Fig. 1



■ Fig. 3 Lead wire arrangement



■ Fig. 4 6012 spring setting



■ Silicone bond KE-441 (3 projections)

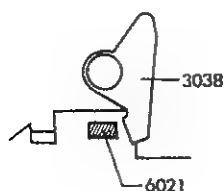
Fit it into positioning hole of body.

Mirror holder

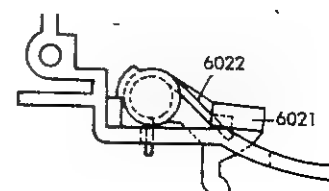
■ Check operation.

9691-2045-07

■ Fig. 2 3038 lever position

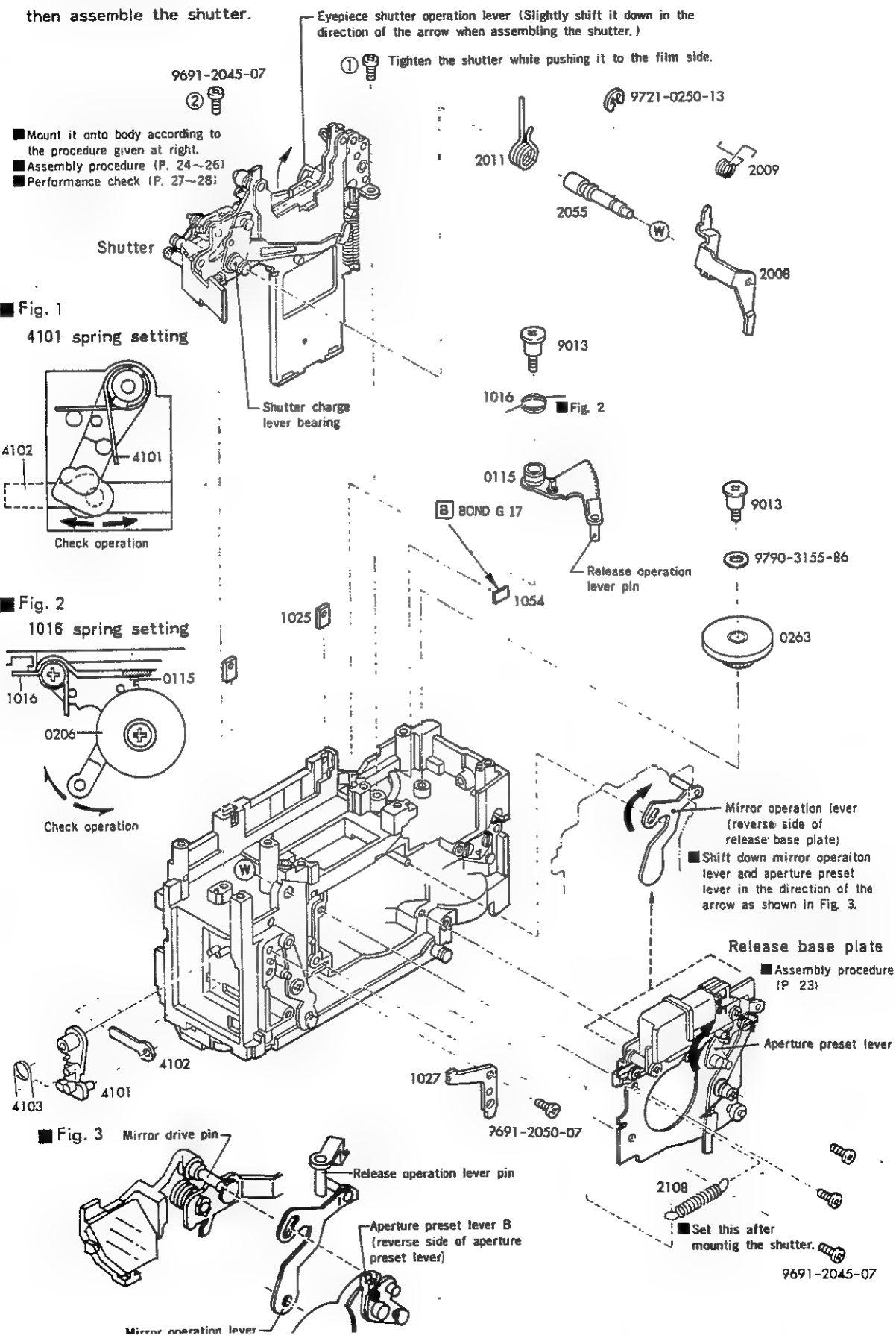


■ Fig. 5 6022 spring setting



## 2 Release base plate and shutter

- First set up the release base plate and adjust the mirror stop timing as explained at right, and then assemble the shutter.

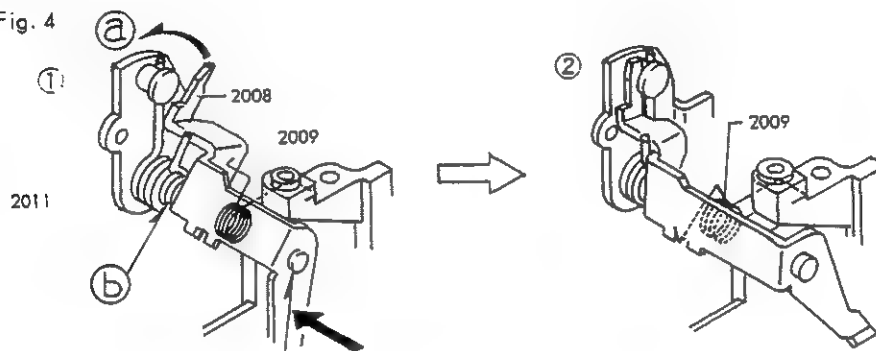




### ■ Shutter block assembly procedure

1. Set 2009 and 2011 onto 2055, then pass it through the hole of body from shutter side.
2. Shifting down eyepiece shutter operation lever slightly mount the shutter block onto the body, then tighten the setscrews ① and ② in order as shown at left.
3. Shift down 2055 to the shutter side and fit 2055 onto shutter charge lever bearing, then secure it with 9721-0250-13.
4. Attach 2008 until the tip of 2055 projects slightly and then set 2011 as shown in Fig. 4 ①. Push 2008 while turning it in the direction of arrow a until it clicks (to fit in groove b of 2055) as shown in Fig. 4 ②.
5. Link 2009 to 2008 and body.

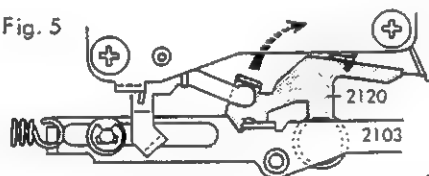
■ Fig. 4



### ■ Release base plate and shutter operation check

1. Attach the film advance lever and turn it.
2. Turn the release operation stop lever (2120) of release base plate unit in the direction of the arrow shown below: when it is disengaged from release operation plate (2103), both mirror and shutter should operate.

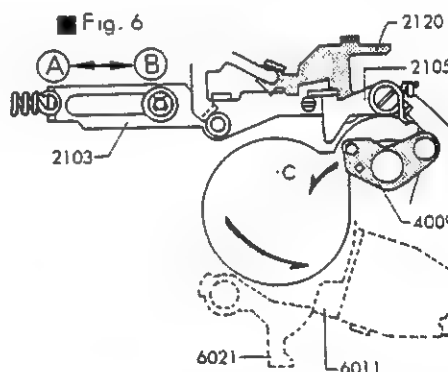
■ Fig. 5



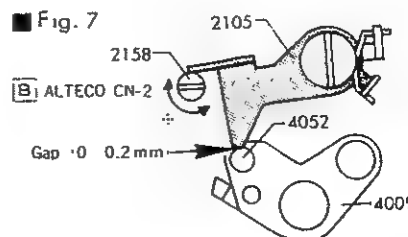
## ■ Mirror stop timing adjustment

1. Disengage release operation stop lever (2120) from release operation plate (2103), then shift 2103 in the direction of A in Fig. 6.
2. Next, turn aperture preset lever (4009) in the direction of C as far as it goes lightly, and then return 2103 a little in the direction of B as shown in Fig. 7.  
In this case, adjust eccentric pin (2158) so that the gap between pin (4052) and mirror operation lever (2105) is 0 to 0.2mm (not in contact).
3. After the above procedure, sparingly apply ALTECO CN-2 to 2158.

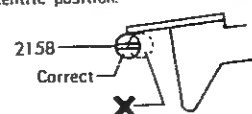
■ Fig. 6



■ Fig. 7



※ This should be adjusted on the left side of eccentric position.



### ■ Check after adjustment

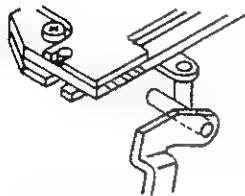
1. Bring the winding base plate into stop condition. (Fig. 1, P. 1)
2. Return 2103 in the direction of B to engage it with 2120. When it is disengaged and operated in the direction of A, mirror holder (6011) should be stopped by mirror stop lever (6021).

### 3 Lens block, aperture dial base plate, circuit plate and mode base plate

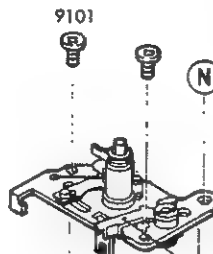
■ Assemble the parts as mentioned above in order.

■ After completion of assembly on the next page, solder the leads according to P. 5, check the operation of each part, and then perform the necessary adjustments according to the procedure from P. 7 on.

■ Fig. 1 Pin position

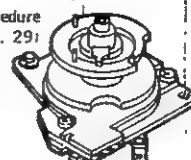


Mode base plate  
■ Assembly procedure  
(P. 29)



Aperture dial base plate

■ Assembly procedure  
(P. 29)



■ Fig. 1  
(Pin position)

■ Fig. 2 (Lever position)

■ Fit it in changeover  
contact holder (Fig. 3)

2250  
'S<sub>1</sub>' ■ Fig. 2

9692-1740-07

9101

Circuit plate

■ Assembly procedure  
(P. 30)

9692-1740-07

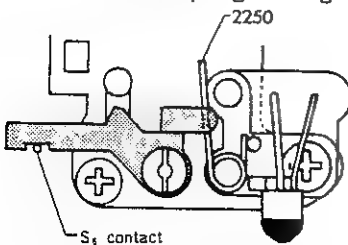
S<sub>1</sub>

LED circuit plate

Pass the LED circuit plate.

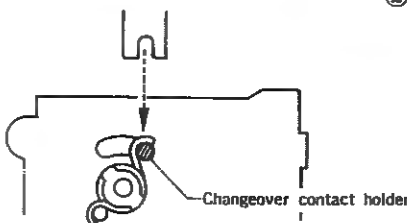
■ When mounting circuit plate with finder block attached, take care that LED reflector of fresnel lens holder is not moved out of position by LED circuit plate.

■ Fig. 2 2250 spring setting



S<sub>1</sub> contact

■ Fig. 3



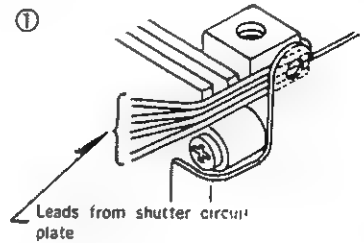
T

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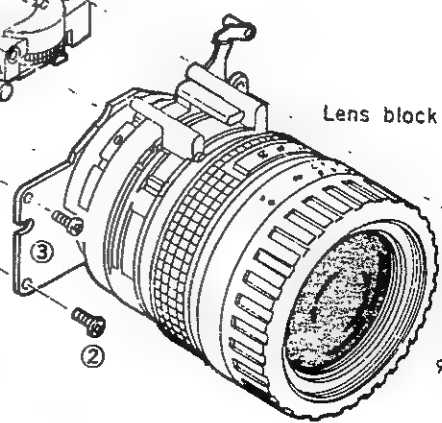
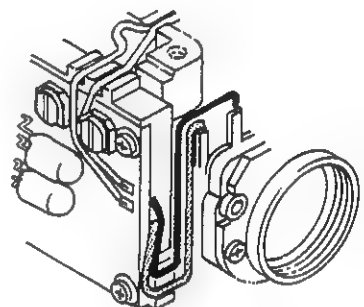
T

■ Lead wire arrangement



Leads from shutter circuit  
plate

② Do not pass the leads  
under the condensor.



Lens block

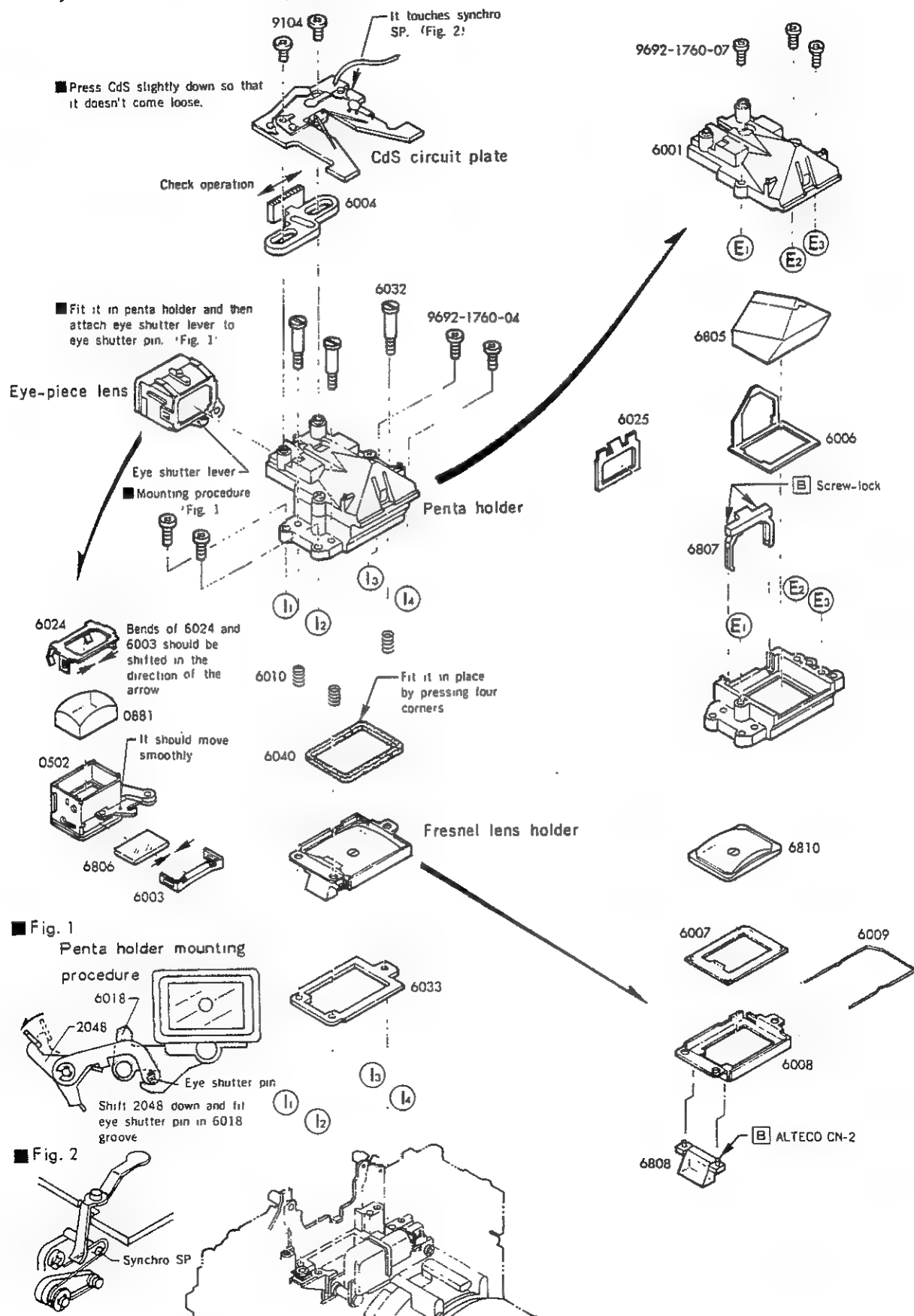
①  
④

9691-  
2045-07

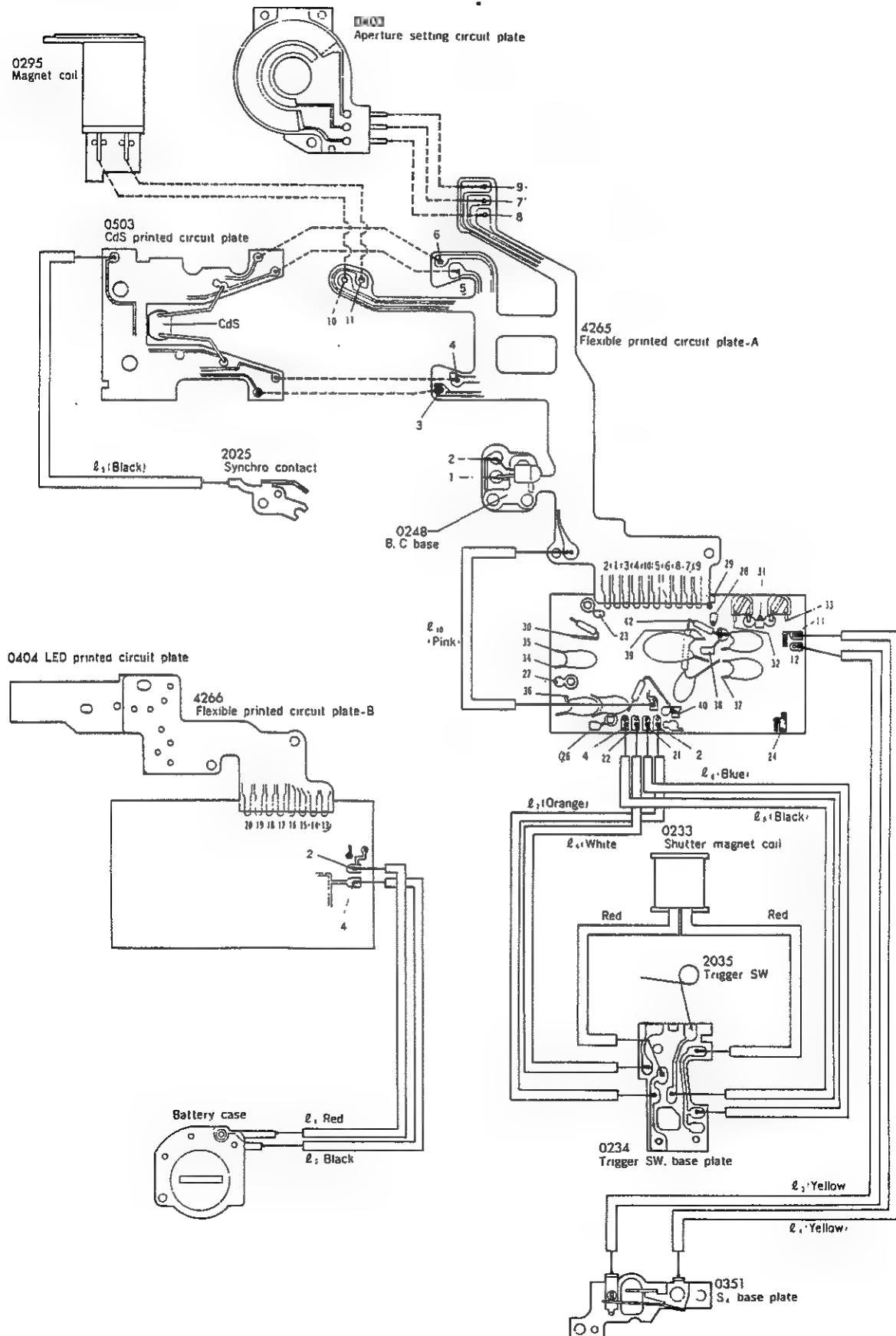
■ Assembly procedure (P. 31-33)  
■ Tighten setscrews ①-④ in  
order.  
■ Check operation.  
(Distance ring, zoom ring,  
aperture, macro lens)

## 4 Finder

■ The finder magnification of this camera is great, therefore it should be carefully cleaned since any dust is liable to be conspicuous.



# Soldering



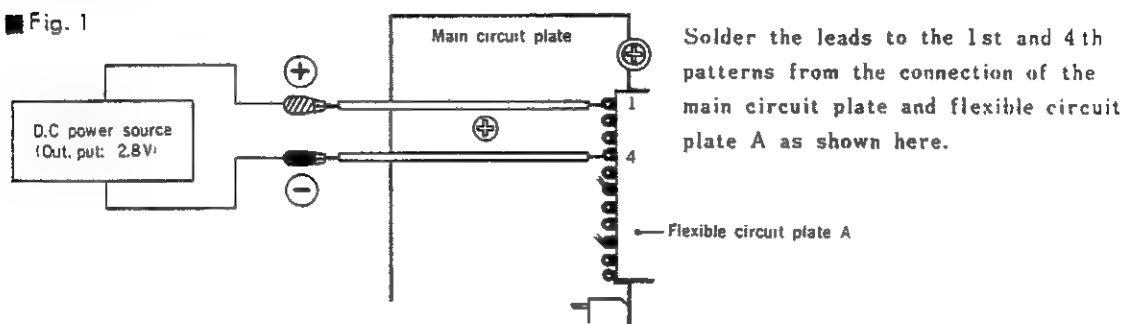
## ■ Power supply method during adjustment etc.

### ① Power supply method

- Use a constant voltage D.C power supply for the adjustment of electrical parts.
- Solder the two lead wires to main circuit plate as illustrated and then connect them to the power source. Connecting them directly to the battery holder with clips is possible but in this case, workability is poor and connection to the negative side is impossible when the bottom cover is mounted.

**[Note]** Temporarily secure the bottom cover so as not to lose the spring of the winding base plate during adjustment.

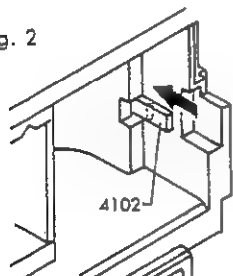
■ Fig. 1



### ② ASA 80 setting method

- When this camera is not loaded with a cartridge, the circuit is set to ASA 250. Therefore, to shift it to ASA 80, use a test cartridge (ASA 80) or follow the method as shown below.

■ Fig. 2



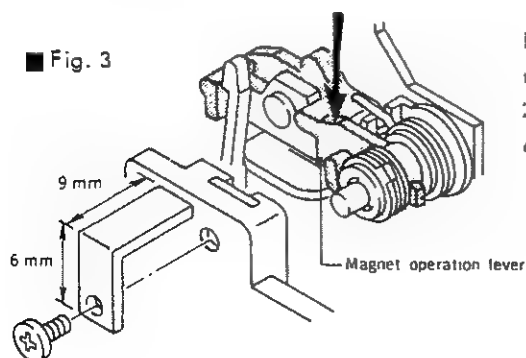
Push in the ASA detection lever (4102) and secure it with tape.

(This method is used because it is impossible to use cartridge during measurement of EE level.)

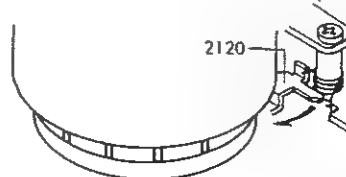
### ③ Shutter releasing procedure

- Mount the top cover, mode dial and release button, and then release the shutter in mode B. In addition, the following method is available.

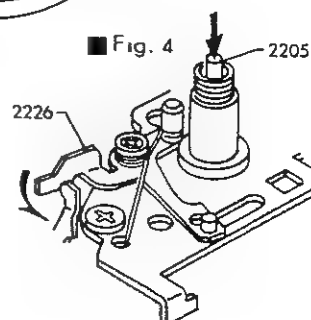
■ Fig. 3



Hold the magnet operation lever with the hand or by using a simple L-shaped jig as shown below, then push 2120 (release operation stop lever) in the direction of the arrow, so that the shutter is kept released.



■ Fig. 4



### ④ Light measuring switch (S<sub>1</sub>) ON

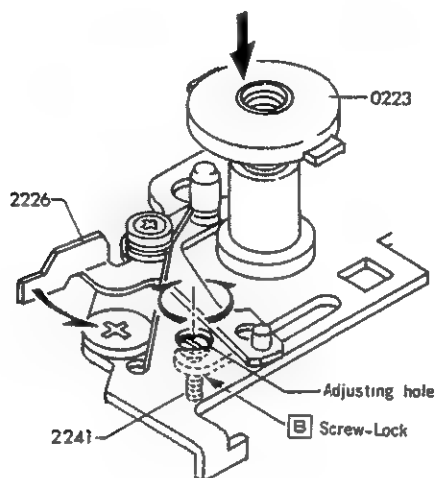
- When the top cover, mode dial and release button are not attached, shift the mode changeover lever (2226) in the direction of the arrow and push the release axis (2205), then S<sub>1</sub> turns ON; another push causes S<sub>2</sub> (release switch) to turn ON. The mode is changed over A→X→B depending on the position of 2226.

## ■ Checking release stroke

### ■ Check and adjustment procedure

1. Put a battery into the camera or connect power source to it, and fit the release button (0223) as in Fig. 1, then check as described in steps 2 and 3, below.

■ Fig. 1



2. Pressing the release button under release lock condition should not cause the LED in the finder to light up. ( $S_1$  should not turn ON.)
  - If LED lights up ( $S_1$  turns ON), insert a screwdriver into the adjusting hole of release base plate and slightly turn the release adjusting screw (2241) counterclockwise.
3. Shift the mode change lever (2226) in the direction of the arrow and slowly depress the release button; it should then be possible to depress the release button at least 0.3 mm, even after shutter release.
  - If the marginal stroke after shutter release is less than 0.3 mm, turn 2241 slightly to the right.
4. After turning 2241, be sure to check as in steps 2 and 3 and apply Screw-Lock to 2241.

## ■ Focus adjustment

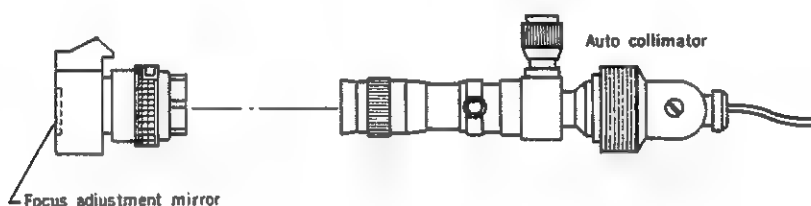
If part replacement, disassembly or repair has been performed on the lens block and might affect the focus position, carry out the focus adjustment according to the procedure described on P. 33.

- Measuring instruments :
- Auto collimator (120 mm or 200 mm)
  - : Focus adjustment mirror (251-3357-76)
  - : Focus adjustment wrench (273-1112-75)

### ■ Focus check and standard

1. Release the shutter and aperture, and set the distance scale ring to infinity ( $\infty$ ) as illustrated below.

■ Fig. 1



2. Check that the reading on the auto collimator is within the allowable range.

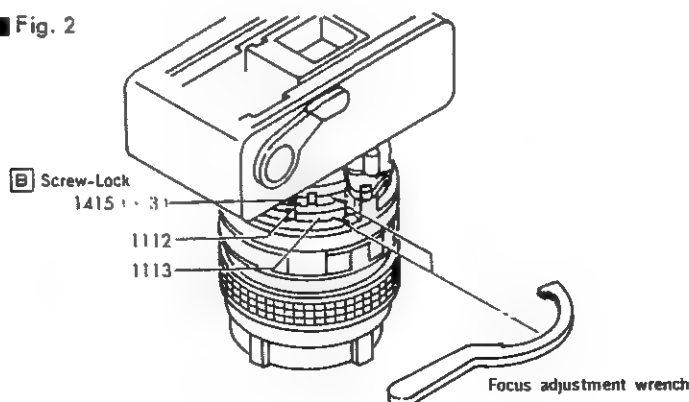
(Standard)

Zoom ring setting	Auto collimator				Remarks
	200 mm		120 mm		
	Standard value	Allowable range	Standard value	Allowable range	
67 mm	+4.3 scale	+2.6~+6.0 scale	+1.7 scale	+1.0~+2.3 scale	Adjust
25 mm		0~+56 scale		0~+21.6 scale	Check only

### ■ Adjusting procedure

1. Loosen the focus adjusting nut B (1113), and screw (1415×3).
2. Set the zoom ring to 67 mm and auto collimator to the reference value, then rotate the focus adjusting nut A (1112) to perform the adjustment.

■ Fig. 2



3. Check that the wide side (25 mm) is within the allowable range, then tighten the 3 screws (1415) evenly and 1113 as well.
4. Check that the focus is not deflected on the TELE side (67 mm) and wide side (25 mm), and then apply Screw-Lock to 1415.

## Finder back adjustment

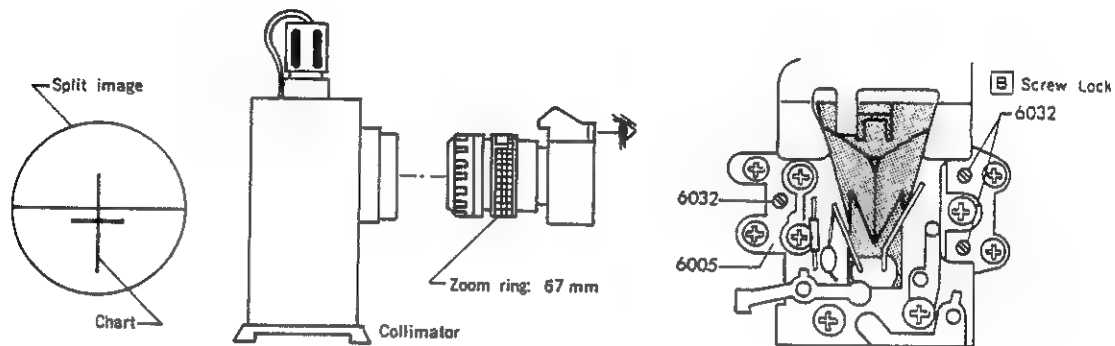
If the mirror holder is removed from the body or disassembled or repaired, check it according to the procedure given on P. 10.

■ Measuring instrument : Collimator (Model RC 1000- I, II, III)

### ■ Adjusting procedure

1. Set the camera so that the chart of the collimator is viewed as shown below. Then turn the three VB adjusting screws (6032) so that the vertical lines of the chart coincide.

■ Fig. 1



2. Next, check for deflection at top, bottom, right and left positions of the finder view field, and if there is any, adjust it by turning 6032, taking care not to affect the coincidence of the vertical lines of the chart image. After adjustment, apply Screw-Lock to the head of 6032.



## ■ Checking finder image

This check must be performed whenever the mirror holder is removed from the body or disassembled or repaired. After adjustment, check the finder back (re-adjustment).

### ■ Checking procedure

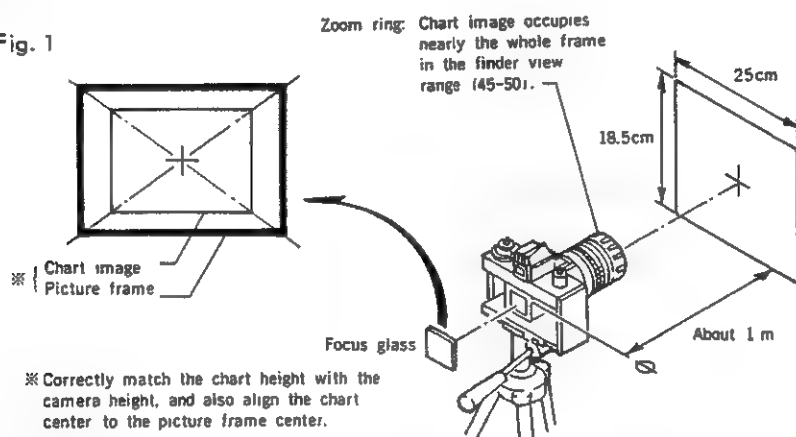
Fix the camera with it facing a paper object (or chart). Then check that the visible range in the finder is completely displayed on the screen (check it on the focus glass) and that the image is not inclined.

If the finder image is inclined or the finder center is deflected from the screen center, make the following adjustment.

### ■ Adjusting procedure

1. Make a chart of 18.5cm×25cm, and set it as shown below.

■ Fig. 1



2. Looking into the finder

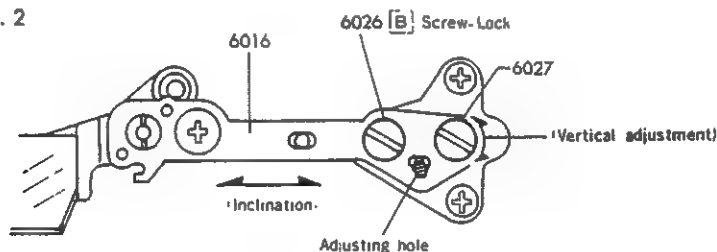
#### ● Adjustment of inclination.....

Loosen the mirror adjusting plate screw (6026) and insert a small screwdriver into the triangular hole of the mirror adjusting plate (6016) to turn it to the right or left.

#### ● Adjustment of vertical deflection.....

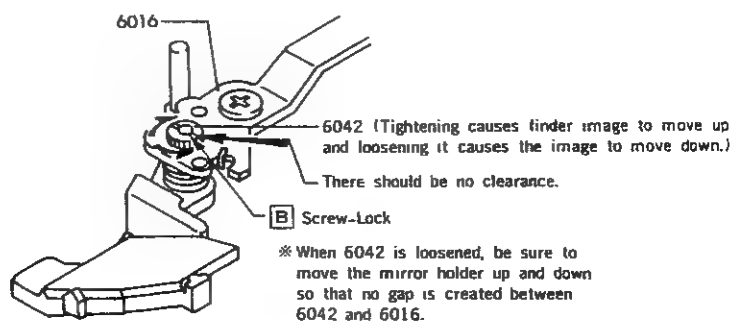
Slightly loosen 6026 and adjust by turning eccentric pin (6027).

■ Fig. 2



- If vertical deflection cannot be adjusted by eccentric pin (6027), remove the lens base plate and release base plate, then turn the mirror adjusting nut (6042) to shift the front and back the position of the mirror.

■ Fig. 3



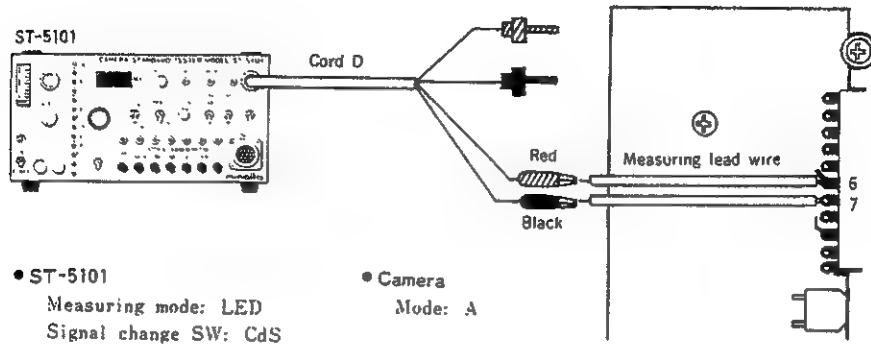
## ■ Check and adjustment of LED vision

■ Measuring instrument : Camera standard tester (Model ST-5101)

### ■ Checking procedure

1. Solder the two lead wires for measurement as illustrated and connect them to the measuring instrument.

■ Fig. 1

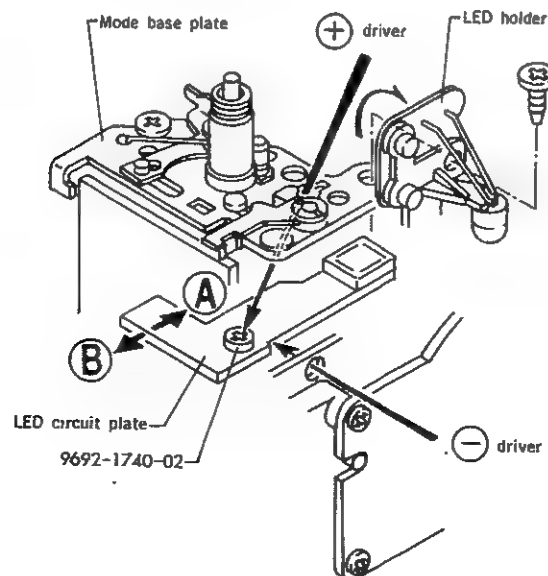


2. Turn on the light measuring switch ( $S_1$ ) and rotate the aperture dial to a position where the LEDs in the finder continuously light up from ▲ (high luminance alarm) to ▼ (low luminance alarm). Then check that the indications can be clearly seen in the range from ▲ to ▼.

### ■ Adjusting procedure

1. Remove the setscrew of LED holder to detach the holder from the mode base plate.
2. Insert a screwdriver into the hole of mode base plate as illustrated below and loosen the setscrew (9692-1740-02). (With the screw loosened, the LED base plate can be shifted in the direction of the arrow (A).)
3. Insert a small screwdriver into the round hole of the body located at the back of the lens base plate, until it touches the LED base plate. Then gradually shift the LED base plate in the direction of the arrow (B).

■ Fig. 2



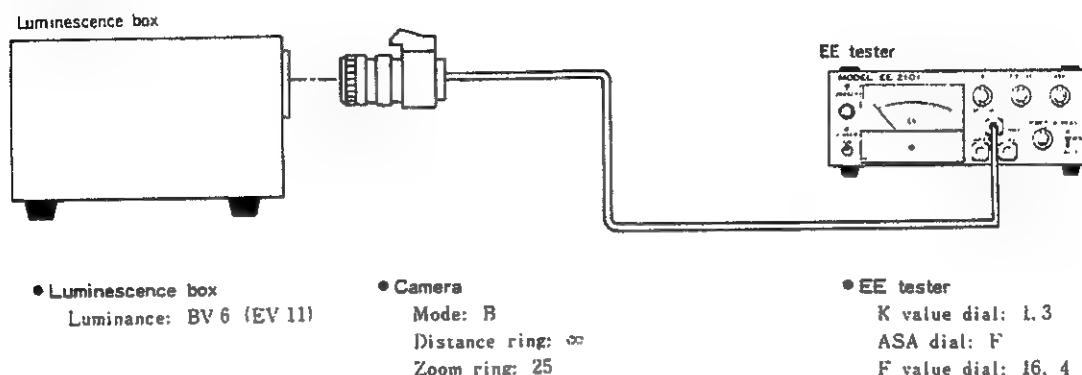
## Aperture diameter adjustment

- Measuring instruments : Luminescence box (Model L-2101, L-222, L-223)  
: EE tester (Model EE-2101, EE-2111)

### ■ Measuring procedure

1. Set the camera and measuring instrument as illustrated below.

■ Fig. 1



2. With the shutter released, shift the measure key switch of EE tester from RESET position to CAL. F. position, then read the indication. (Check F 16 and F 4).

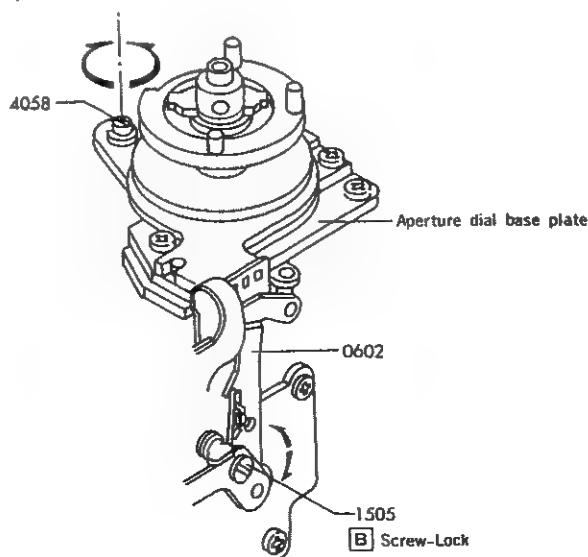
(Standard)

Aperture	Allowable range (EE tester indication)
F 16	$0 \pm 0.2$ EV
F 4	$0 \pm 0.15$ $0.25$ EV

### ■ Adjusting procedure

1. Set the aperture to F 16 and turn the cam lever adjuster (4058) of aperture dial base plate section so that the EE tester indicates  $0 \pm 0.2$  EV as shown in Fig. 2.
- If the aperture block is disassembled or the diaphragm operation lever (0602) is replaced, and only when necessary adjustment cannot be made with adjusting pin (4058), adjust it by turning eccentric pin (1505).

■ Fig. 2



2. With the aperture set at F 4, check that the EE tester indication is  $0 \pm 0.15$   
 $0.25$  EV.

## EE adjustment-1...CdS resistance value measurement

(Selection of  $R_1$  and  $R_2$ )

■ Measuring instruments : Luminescence box (Model L-2101, L-222, L-223)

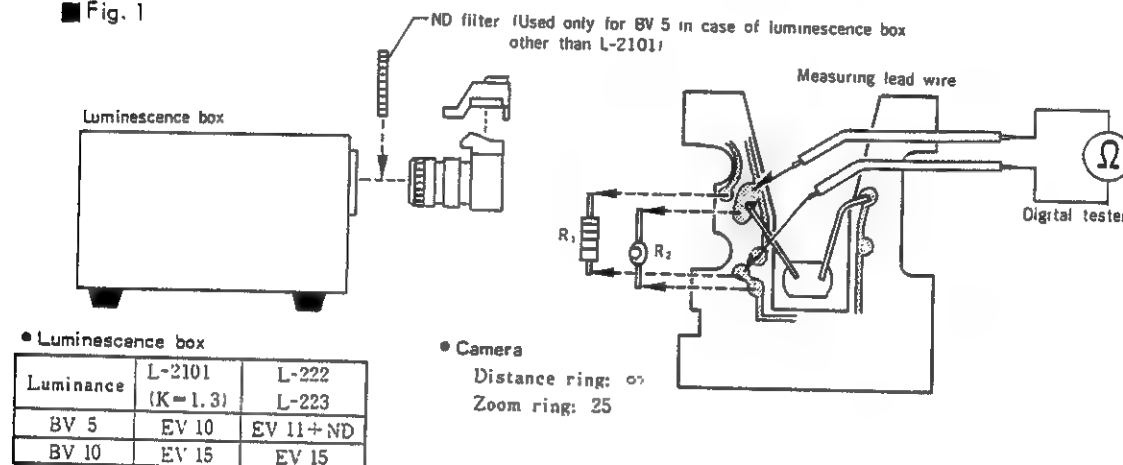
: Digital tester

: ND filter (50%)...It is unnecessary of the luminescence box is L-2101.

### ■ Measuring procedure

1. Remove resistors  $R_1$  and  $R_2$  from CdS circuit plate, and solder the two lead wires for measurement and temporarily put on the top cover as illustrated below.

■ Fig. 1



### 2. Measurement of RBV 5

Set the luminescence box to BV 5 and measure the resistance value with a digital tester.  
(Replace CdS if the measured value is not within 70 to 300 K $\Omega$ .)

### 3. Measurement of RBV 10

Set the luminescence box to BV 10 and measure the resistance value.  
(Replace CdS if the measured value is not within 10 to 30 K $\Omega$ .)

### ■ Determination of $R_1$ and $R_2$

Determine the  $R_1$  and  $R_2$  from the measured values of RBV 5 and RBV 10 (or approximate) using the tables on the next page, and then attach them to the CdS circuit plate.

[Example] When measured value RBV 5=143 K $\Omega$  and RBV 10=17.8 K $\Omega$

$R_1 = 3.3$ (M $\Omega$ ) and  $R_2 = 5.6$ (K $\Omega$ ) from the intersection on the ordinate and abscissa for the approximate value of RBV 5 (140 K $\Omega$ ) and that of RBV 10 (18 K $\Omega$ ) in the numerical table.

RBV 10 \ RBV 5		RBV 5		
RBV 10	17	18	19	
	130			
	140		3.3 5.6	
	150			



## ■ EE adjustment-2...180mV adjustment (Selection of $R_4$ )

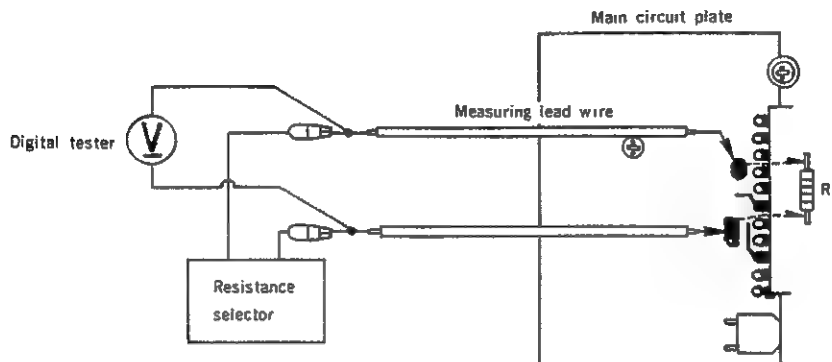
■ Measuring instruments : Digital tester

: Resistance selector (Model RS-III, RS-II)

### ■ Adjusting procedure

1. Remove  $R_4$  and solder the two leads for measurement and connect the measuring instrument as illustrated.

■ Fig. 1



2. Next, turn ON the light measuring switch ( $S_1$ ), and set the resistance selector dial so that the voltage indication of digital tester is as close to 180mV as possible.
  3. Select  $R_4$  from the following table whose resistance is nearest to the value obtained by the resistance selector. Solder the resistor to the main circuit plate. Then check that the voltage at both ends of  $R_4$  (measured with resistance selector removed) is  $180 \pm 3$  mV.
- If the voltage is not within  $180 \pm 3$  mV, change the magnitude of  $R_4$  using the table below, and again check it.

Voltage increases.....with increase in resistance of  $R_4$ .

Voltage decreases.....with decrease in resistance of  $R_4$ .

(Kinds of  $R_4$ )

Resistance (K $\Omega$ )	Part No.	Resistance (K $\Omega$ )	Part No.
20	9421-2036-32	39	9421-3936-32
22	9421-2236-32	47	9421-4736-32
24	9421-2436-32	56	9421-5636-32
27	9421-2736-32	68	9421-6836-32
30	9421-3036-32	100	9421-1046-32
33	9421-3336-32	200	9421-2046-32

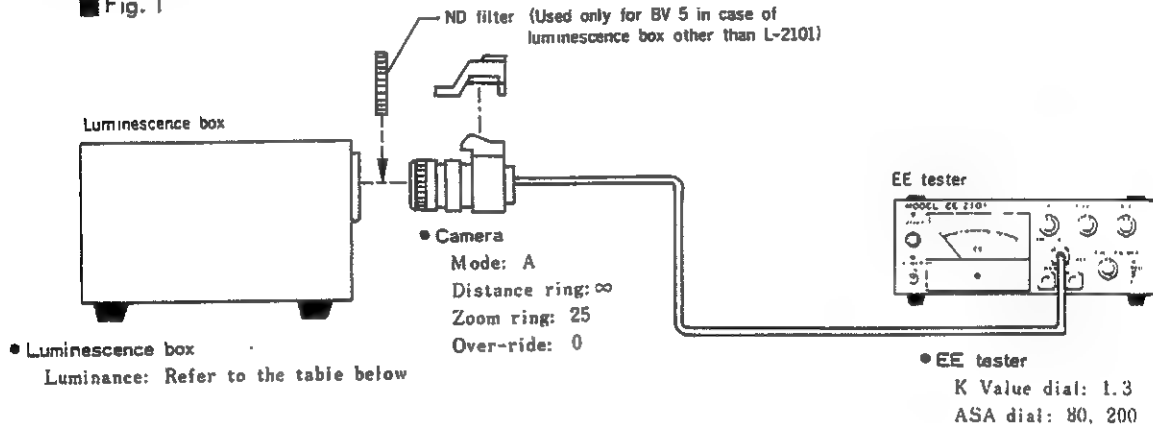
## ■ EE adjustment-3...EE level adjustment (Adjustment of $VR_2$ , $S_3$ )

- Measuring instruments : Luminescence box (Model L-2101, L-222, L-223)  
 : EE tester (Model EE-2101, EE-2111)  
 : ND filter (50%)...It is unnecessary if the luminescence box is L-2101.

### ■ Adjusting procedure

1. Temporarily mount the top cover, mode dial, release button, and aperture dial onto the camera, and then set the measuring instrument as shown below.

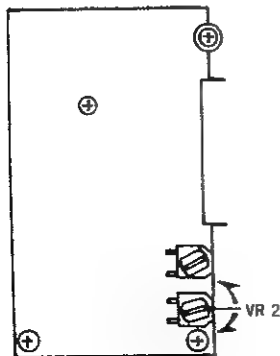
■ Fig. 1



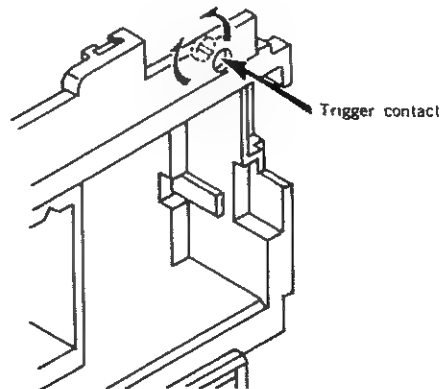
2. Adjust and check in accordance with the following table.

Step	Luminescence box Lumina- nce	L-2101 (K=1.3)	EE tester (ASA)	Camera		Standard (EE tester indication)	Adjusting part
		L-222, L-223		ASA	Aperture		
1	BV 5	$\frac{\text{EV } 10}{\text{EV } 11+\text{ND}}$	80	80	F3.5	$+0.3 \pm 0.1 \text{EV}$	$\text{VR}_2$ .....Fig. 2
2	BV 9	$\frac{\text{EV } 14}{\text{EV } 14}$	80	80	F3.5	$+0.3 \pm 0.5 \text{EV}$	$\text{S}_3$ .....Fig. 3 (Trigger contact)
3	BV 5	$\frac{\text{EV } 10}{\text{EV } 11+\text{ND}}$	200	250	F3.5	$0 \pm 0.3 \text{EV}$	Check only
4	BV 9	$\frac{\text{EV } 14}{\text{EV } 14}$	80	80	F 8	$+0.3 \pm 0.8 \text{EV}$	

■ Fig. 2 Adjustment of  $VR_2$



■ Fig. 3 Adjustment of  $S_3$  (trigger contact)



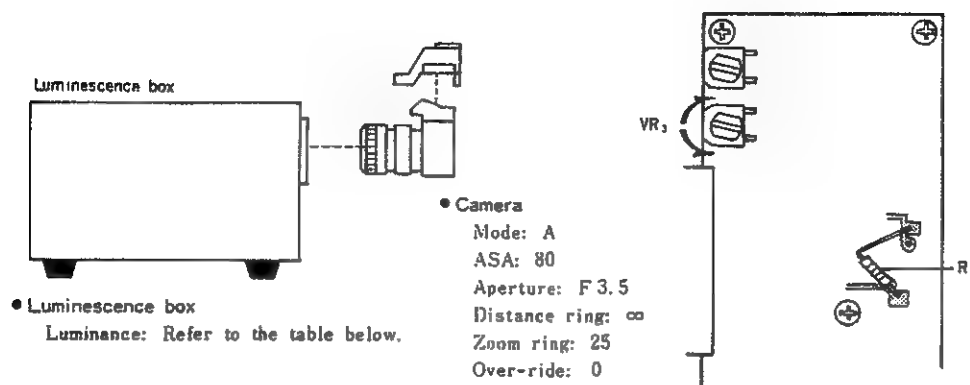
## ■ Adjustment of LED indication

■ Measuring instrument : Luminescence box (Model L-2101, L-222, L-223)

### ■ Adjusting procedure

1. Temporarily mount the top cover onto the camera.

■ Fig. 1



(Luminance & Standard)

Luminescence box Luminance	L-2101 (K=1.3) L-222, L-223	Allowable range ( $\pm 1$ EV)				
		EV	+1	+0.5	0	-0.5 -1
BV 6	EV 11	250	☀	☀	●	●
		125	●	☀	☀	●
		60-4	☀	☀	☀	☀
BV 9	EV 14		☀	☀	▲	▲
		1000	●	☀	☀	●
		500	●	●	●	☀

Cautions : Only ● lights up at BV 6...With over-ride set at -1, check that LED for 125 lights up

Only ▲ lights up at BV 9...With over-ride set at +1, check that LED for 1000 lights up.

2. Set the luminescence box to BV 6, then adjust VR 3 (shown above) so that only LED for 125 lights up with light measuring switch ( $S_1$ ) turned ON.
3. Next, with the luminescence box set at BV 9, check that the specified LED lights up. If an LED other than specified lights up, perform the deflection adjustment given below or adjust by turning VR 3 so that both BV 6 and BV 9 satisfy the specification.
  - To check for error on the low speed side is difficult, therefore it is desirable that the deflection for BV 6 and BV 9 be as close to 0 as possible.
4. Deflection adjustment (after adjustment of BV 6)
  - LED which lights up at BV 9 is deflected to a speed higher than the specification  
... Change  $R_s$  to smaller resistance.
  - LED which lights up at BV 9 is deflected to a speed lower than the specification  
... Change  $R_s$  to larger resistance.
  - After changing  $R_s$ , perform the adjustment from the beginning.



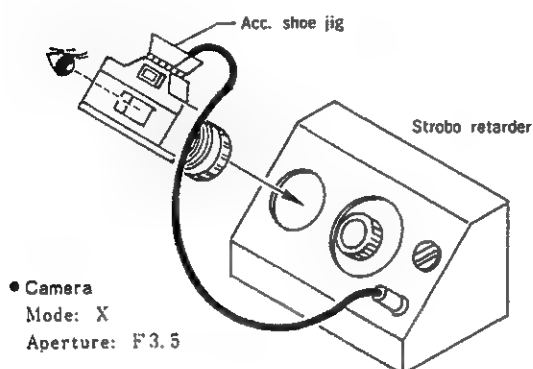
## ■ Synchro check

- Measuring instruments : Strobe retarder (Model III)  
: Strobe (With synchro auto control circuit---Minolta)

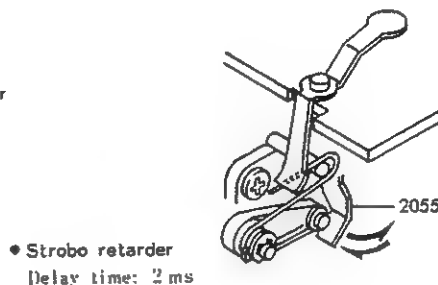
### ① Check of X time lag

Mount the top cover and connect the accessory shoe and strobe retarder by using the acc shoe jig. Then, release the shutter several times to check that the shutter is fully open by observing from the film position.

■ Fig. 1



■ Fig. 2



Standard	At least 2ms until appearance of second blade after turning ON of X contact.
----------	--

### ■ Adjusting procedure

If the second blade is within the screen when the strobe retarder lights up, bend the synchro contact (2025) and adjust the timing of X contact ON as shown in Fig. 2.

### ② Check of auto X circuit

Set the strobe with synchro auto control circuit onto the accessory shoe, and then check the following points.

- Set the camera mode to a position other than L, and the light measuring switch (S<sub>1</sub>) to ON, and then observe the alteration of LED indication. The normal auto speed should be indicated (not at X, B) until completion of strobe charging, and the indication should go out on completion of charge and the LED for 125 should blink.
- Whatever shutter speed is indicated before completion of charge, it should synchronize with shutter release after completion of charge.

## ■ Check of B.C voltage, etc.

- Measuring instruments : Constant voltage D.C power supply  
: Digital tester

### ■ Checking procedure

Change the power supply voltage according to the following items, and check that the specification is satisfied.

#### ① B.C voltage

Standard (V)	Allowable range
2.0 ± 0.20	B.C should not light up at 1.8V. B.C should light up at 2.2V.

#### ② Voltage for LED in finder to turn OFF

Standard	LED in finder should light up when B.C checker is on.
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#### ③ Release lock voltage

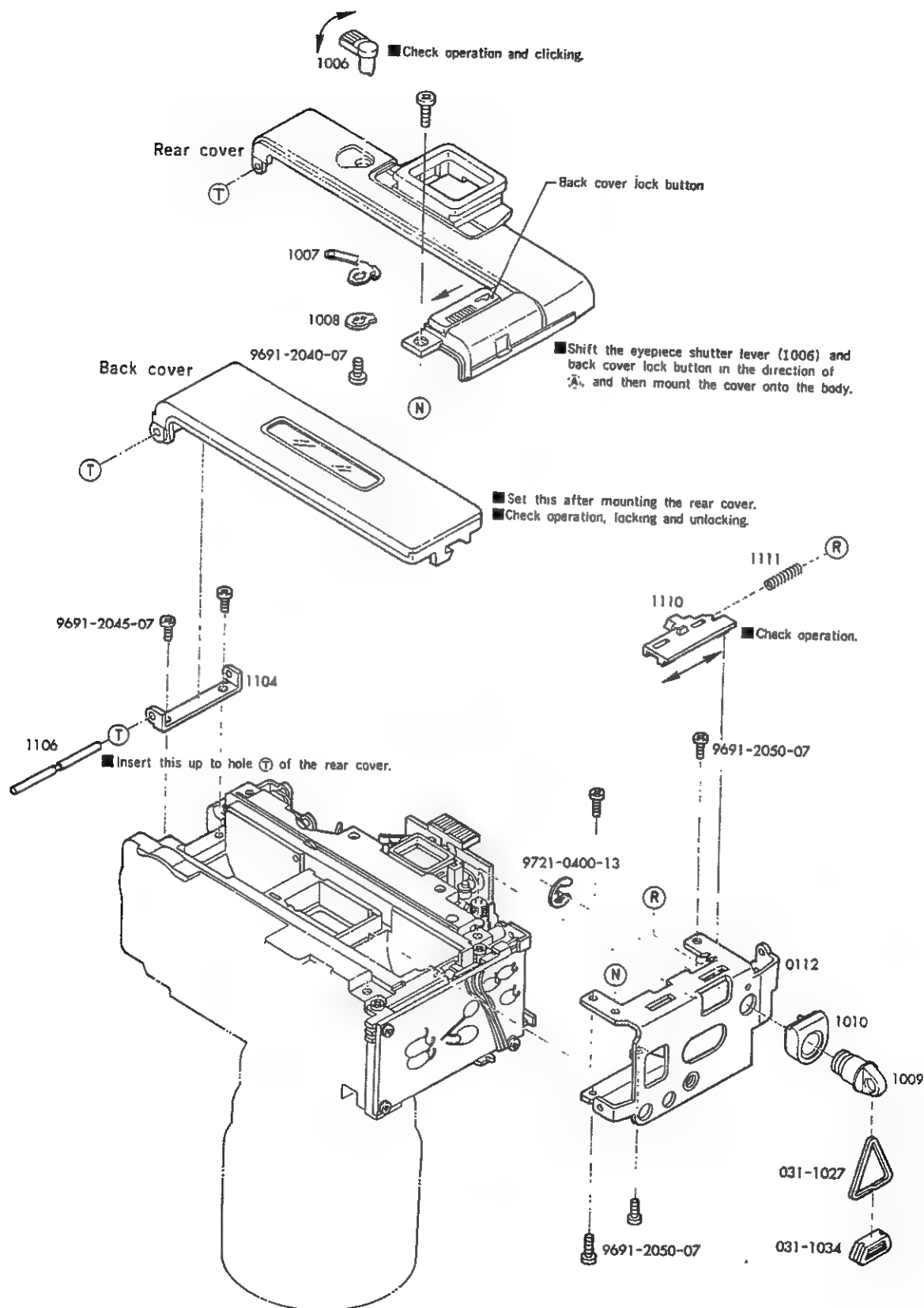
Standard (V)	Allowable range
2.0 ± 0.20 0.25	Release should be locked at 1.75V. Release should be possible at 2.20V.

#### ④ Minimum operation voltage

Standard	There should be no abnormality until release locking.
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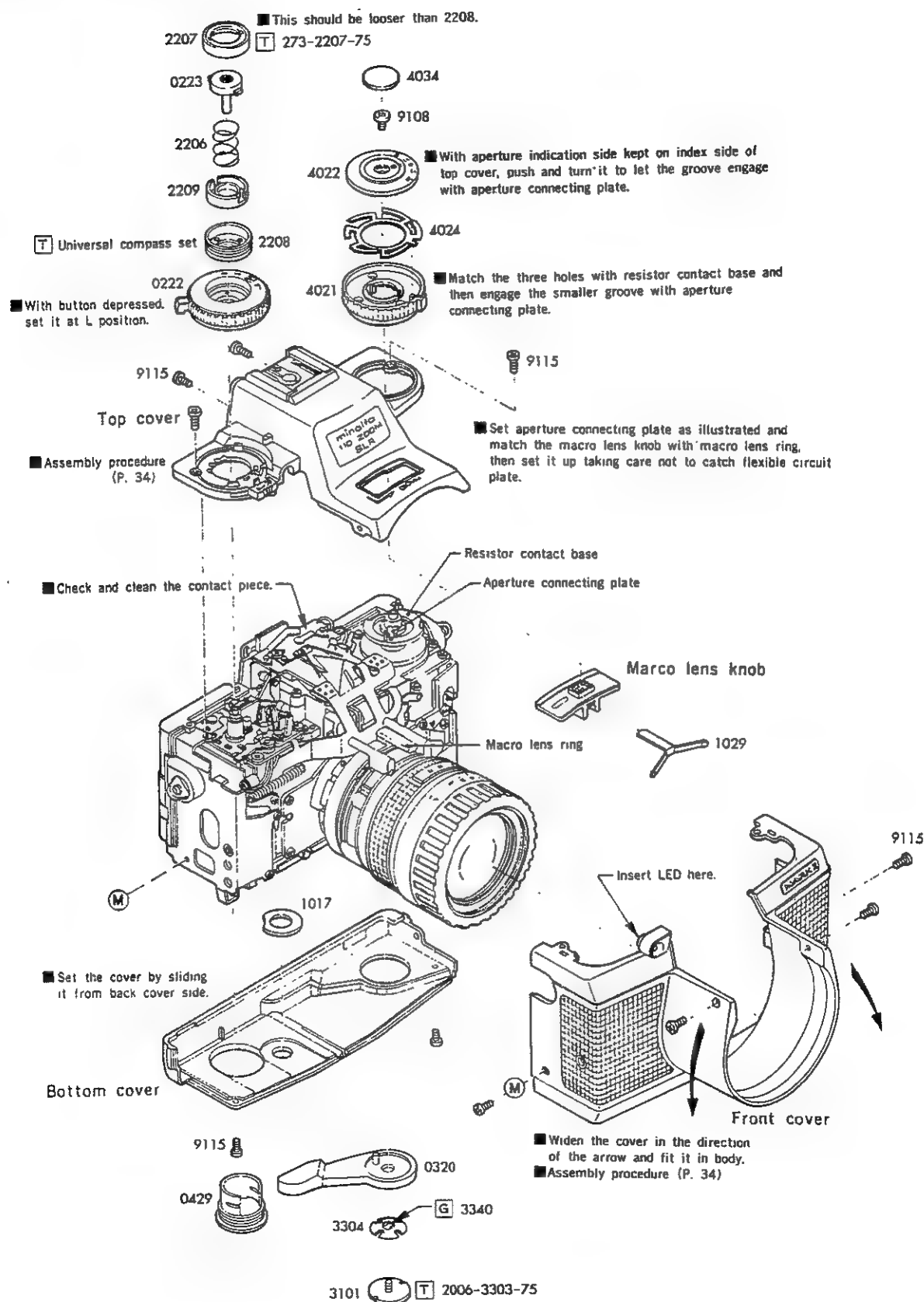
**Note:** For performance guaranteeing voltage, refer to the inspection standard.

## 5 Outer casing- I



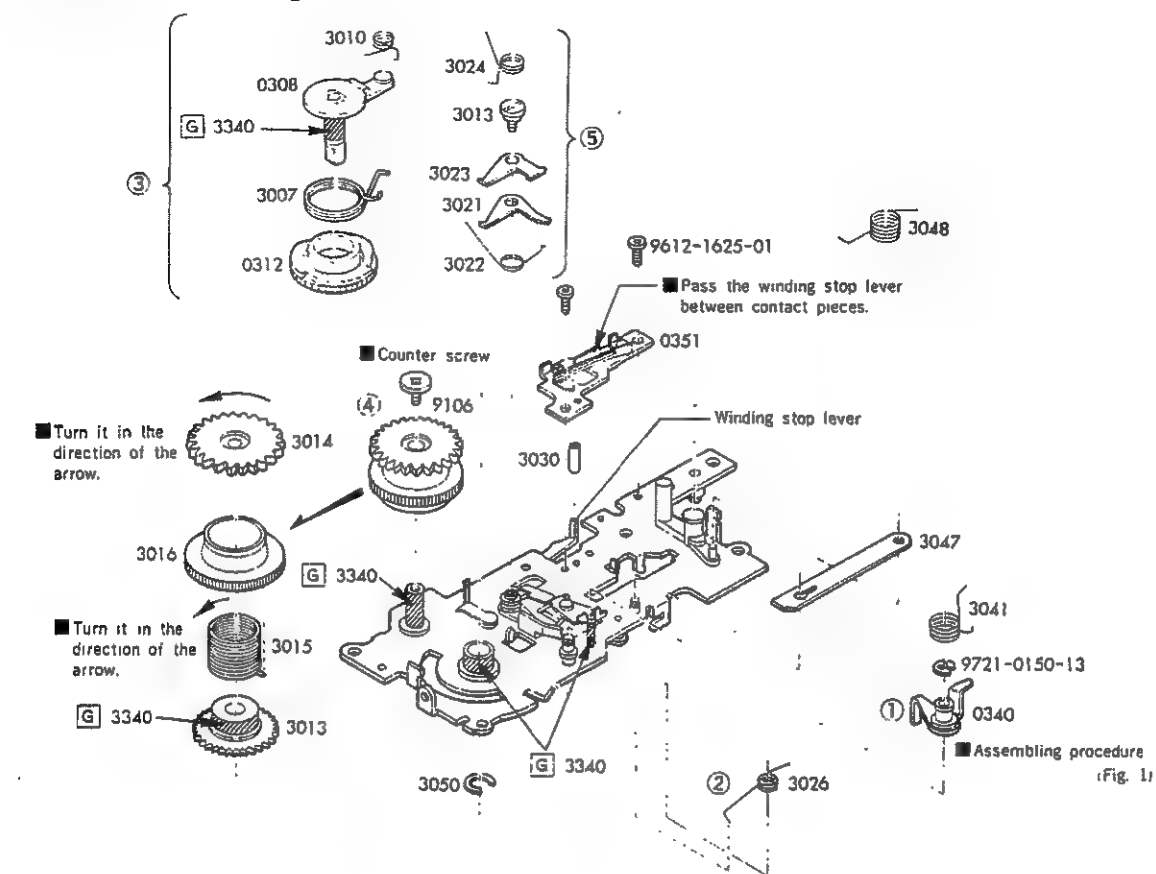
## 6 Outer casing-II (Complete body)

■ Check for dust in the finder, then mount the front cover, top cover and bottom cover in order.

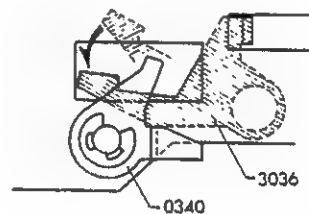


## ■ Assembly of winding base plate

■ Assemble the parts, setting the levers and springs in correct positions, in accordance with the procedure ①~⑤ in Fig. 3, 4.

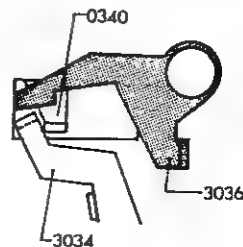


■ Fig. 1 0340 lever position

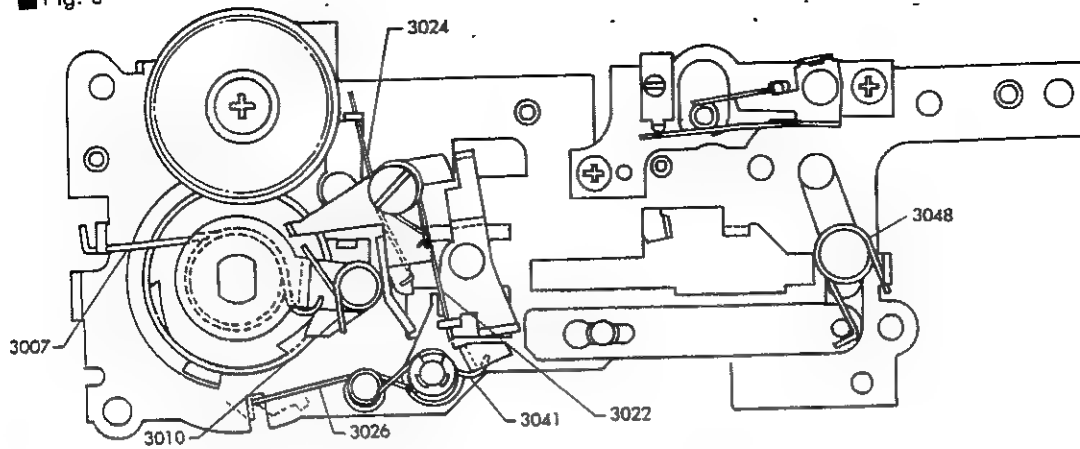


Shift the set lever stop claw (3036) in the direction of the arrow.

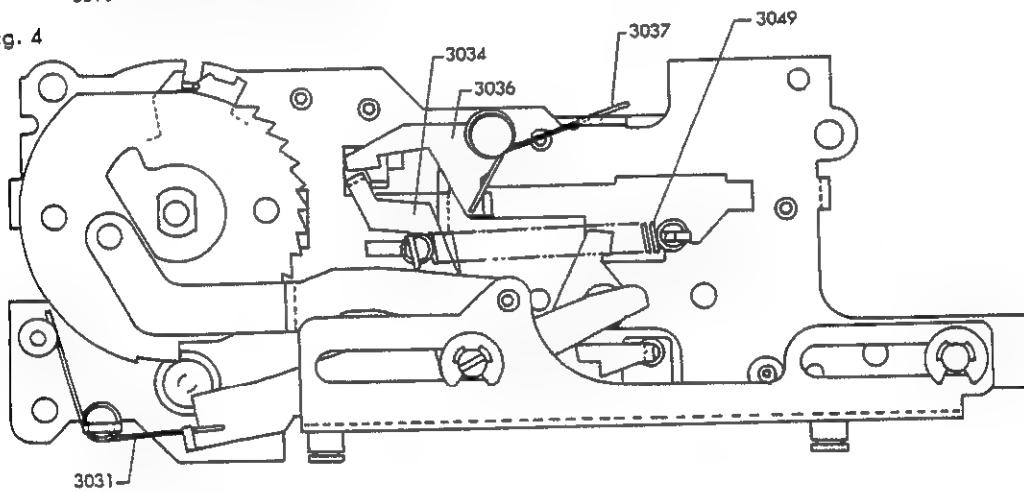
■ Fig. 2 3034 lever position



■ Fig. 3



■ Fig. 4



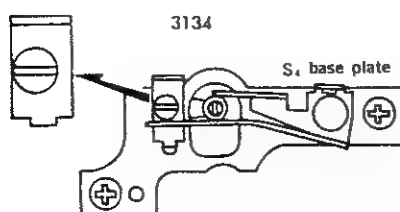
#### ■ Operation check

1. Temporarily fix the film advance lever, and disengage the winding set lever (3034) from set lever stop claw (3036). (Fig. 4)
2. Turn the film advance lever completely and then return it slowly to the original position, then the next winding should be impossible.
3. When 3034 is disengaged from 3036, winding should be possible.

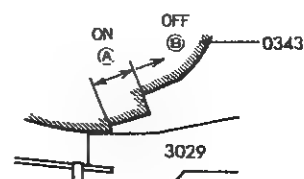
## ■ S<sub>4</sub> adjustment

1. Turn the S<sub>4</sub> adjusting pin (3134) as shown in Fig. 5.
2. When shutter charge turning plate (0343) is slowly returned, check using the tester that S<sub>4</sub> is OFF with winding stop lever (3029) at (A), and ON with the lever at (B), as in Fig. 6.
6. If it does not turn ON, adjust by turning 3134.

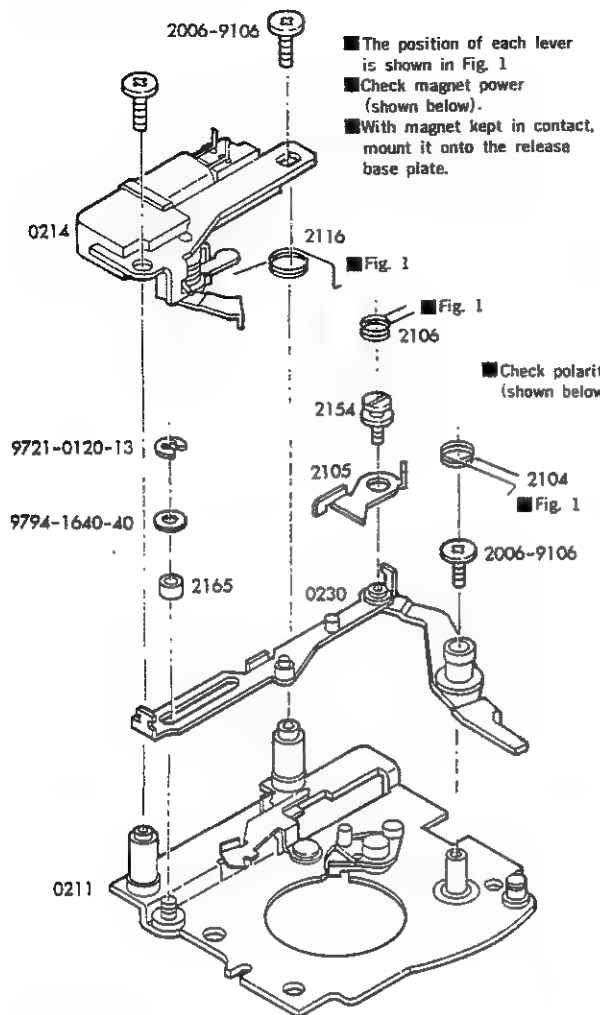
■ Fig. 5



■ Fig. 6



## Release base plate assembly



### Check after completion of assembly

1. With magnet kept in contact, pushing the release operation lever in the direction of (A) in Fig. 1 should cause the release operation plate to be stopped by 2120.
2. With magnet released, the release operation plate should move to the left, and then pushing the release operation lever in the direction of (B) in Fig. 1 should cause the magnet to come into contact again.

※ Contacting surface between 2109 and 0251 should be free of dust, marks, scratches, etc.  
If FLONSOLVE has been used to clean, apply solvent (FC-77) diluted 10 times with diffusion preventive (FC-721) to the contacting surfaces.  
(After applying the solvent, let the surfaces stand for about 1 hour.)

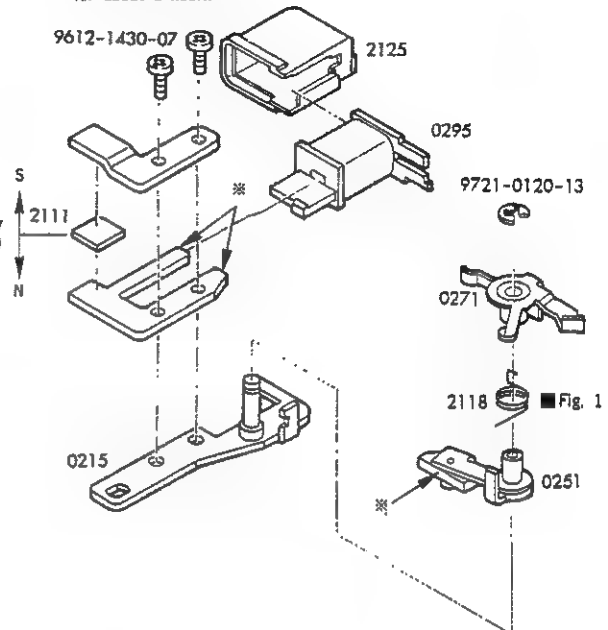
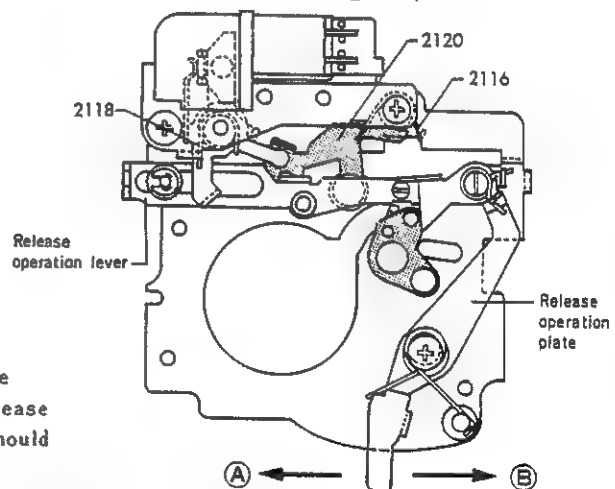
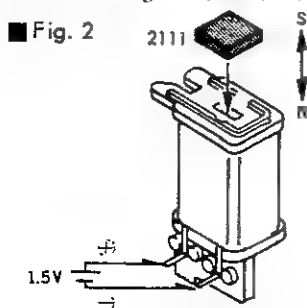


Fig. 1 Spring setting & operation check



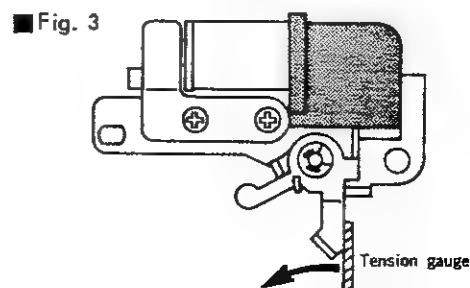
## Magnet polarity checking

With D.C power source (1.5V) or battery connected to the terminal of magnet coil as illustrated below, the bottom polarity is N when release magnet (2111) is still.



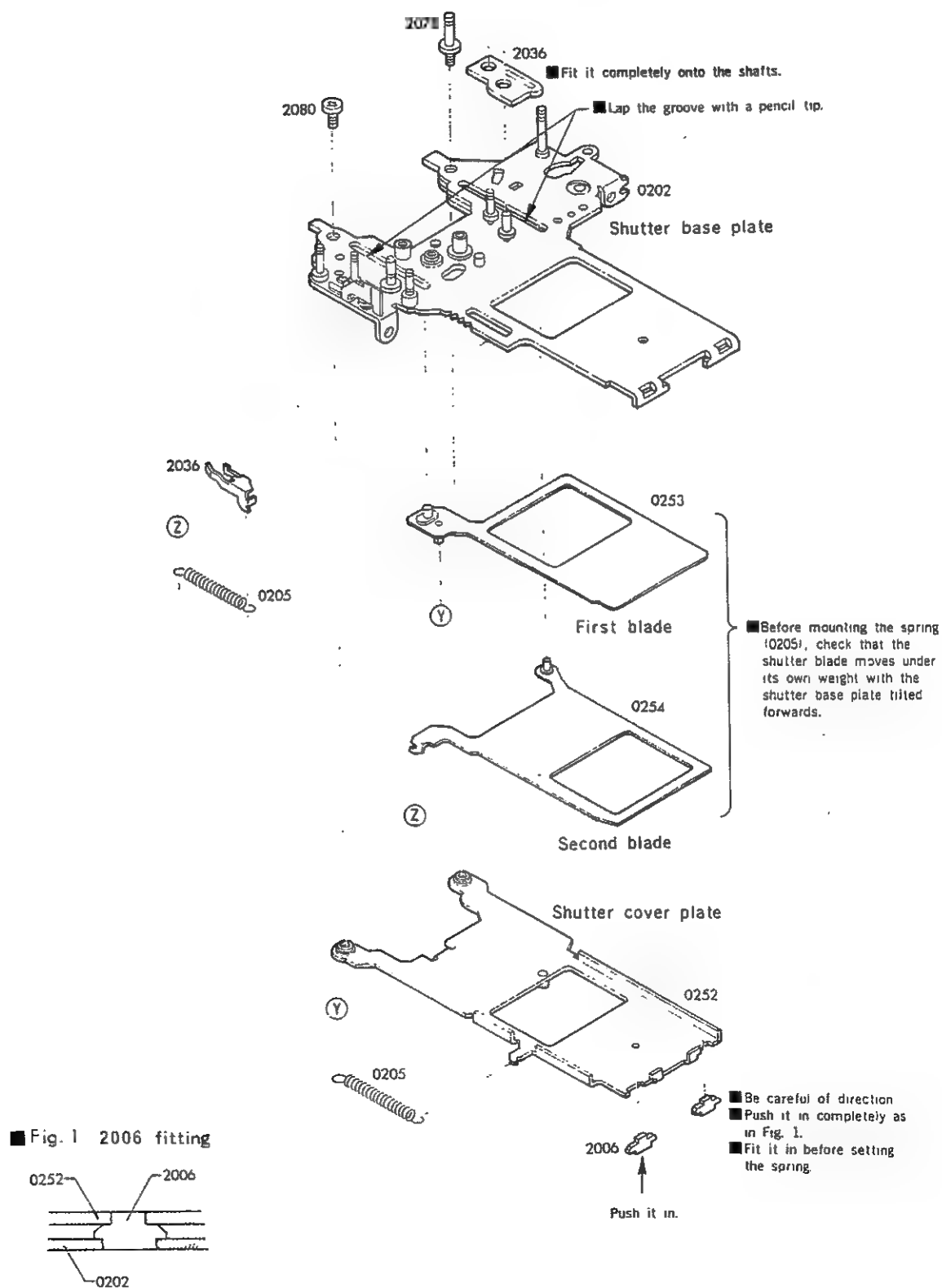
## Magnet power checking

Set the tension gauge as shown below and measure twice. Then the gauge should not come off at 100g or less. If it comes off, check for dust or scratches on the contacting surfaces.



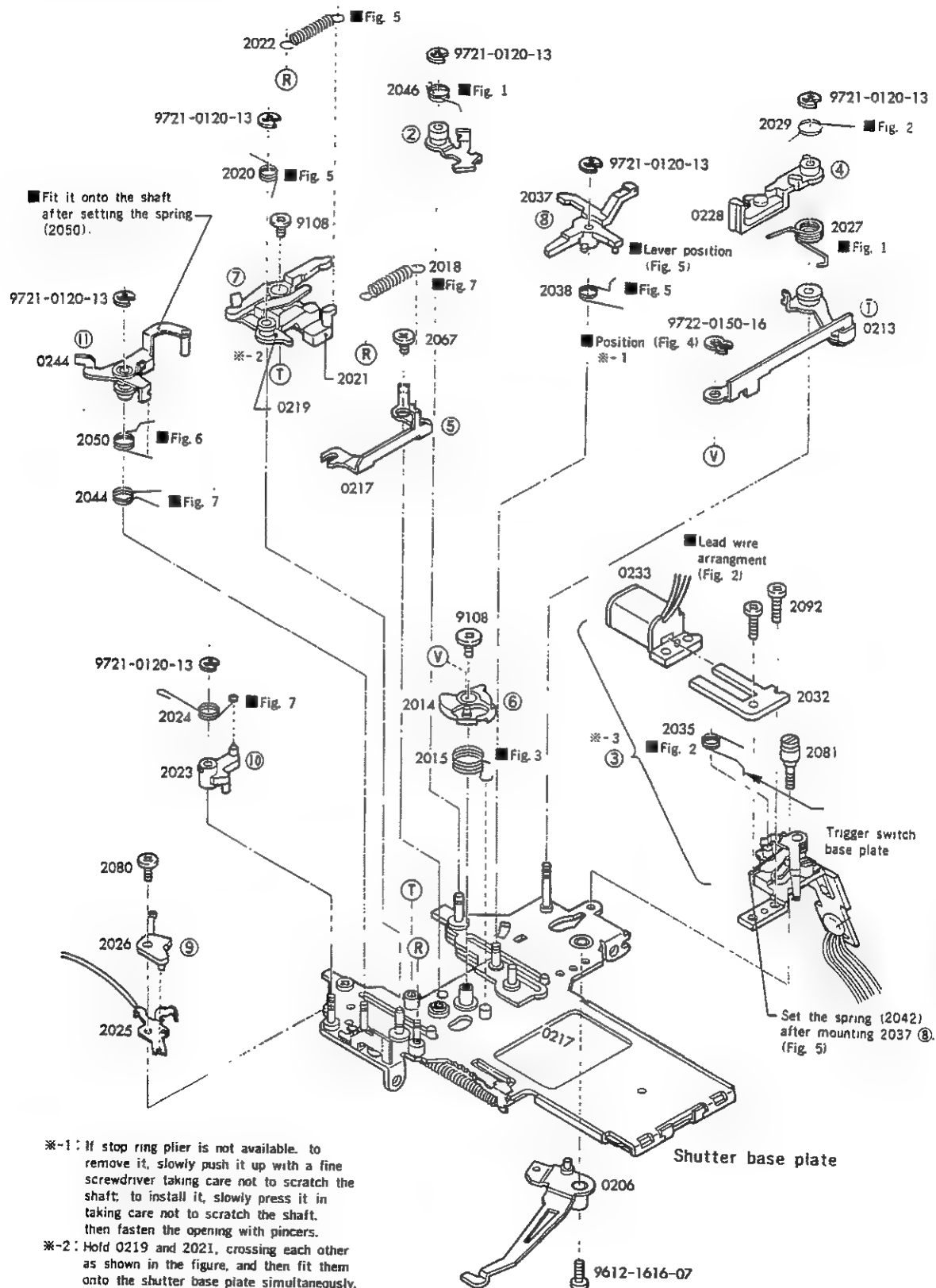
## Shutter assembly-1

- Assemble the parts according to the procedure given on P. 24 through P. 25, and check the performance.
- Be careful of fingerprints, grease, etc. on the shutter blade.



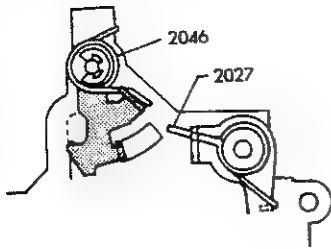
## Shutter assembly-2

■ Assemble the parts according to Fig. ①~⑦, setting the levers in the order ①~⑬

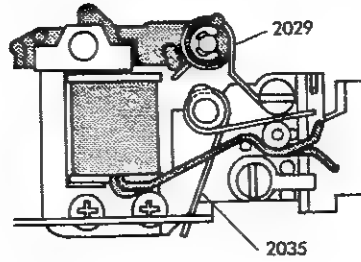




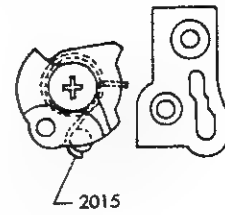
■ Fig. 1 2027, 2046 spring setting



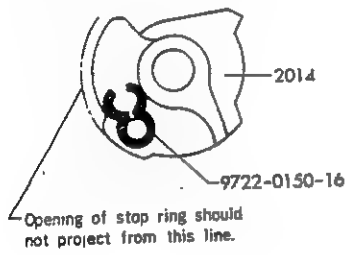
■ Fig. 2 2029, 2035 spring setting



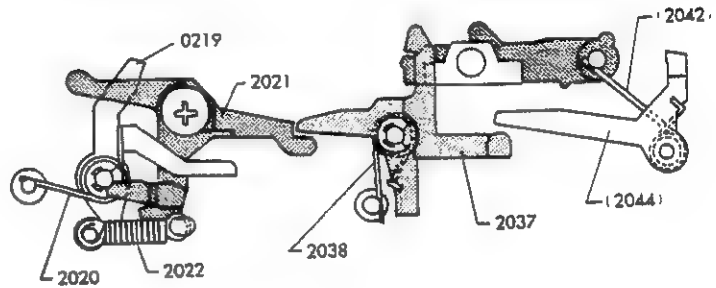
■ Fig. 3 2015 spring setting



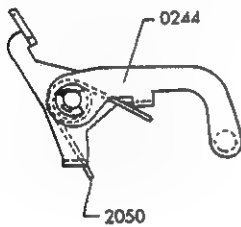
■ Fig. 4 Stop ring position



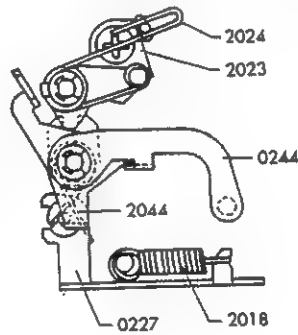
■ Fig. 5 2020, 2022, 2038, 2042 spring setting



■ Fig. 6 2050 spring setting



■ Fig. 7 2018, 2024, 2044 spring setting



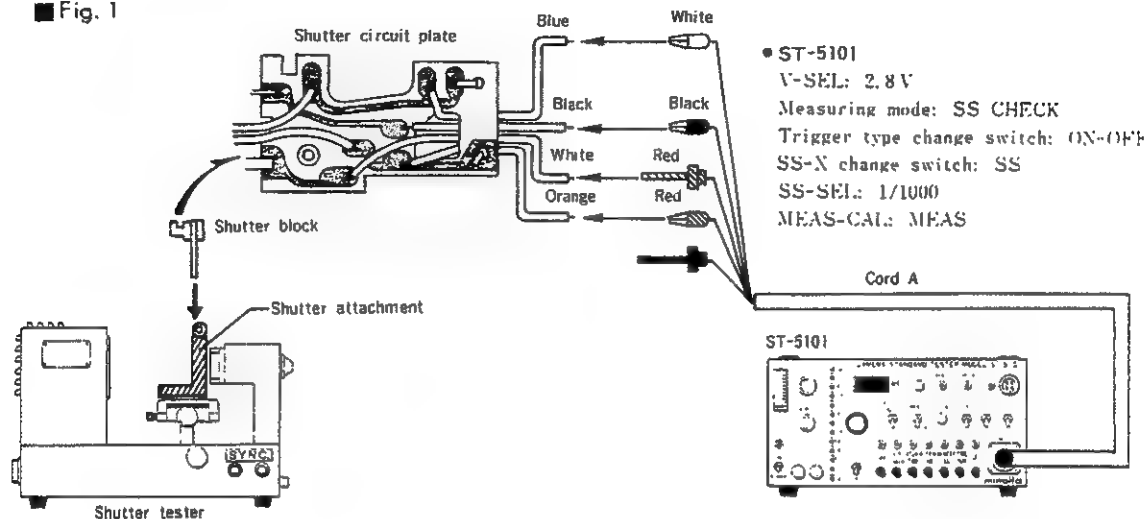
## ■ Shutter block performance checking

- Measuring instruments : Shutter tester (Model S-2101, FS1D-MN4)  
 : Camera standard tester (Model ST-5101)  
 : Shutter Attachment (273-0201-75)

### ■ Preparations

1. Position the shutter attachment on the camera base of the shutter tester.

■ Fig. 1

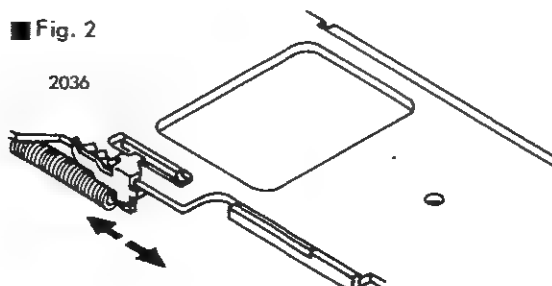


- Horizontal position....Adjust the position so that the picture frame center of the shutter is nearly aligned to the center of the light receiving section of the shutter tester.
  - Vertical position .....By using the positioning lamp of the shutter tester or with the shutter block set onto the attachment, release the shutter and visually adjust by moving the camera base vertically so that the light receiving sections of ranges A and B of the shutter tester are positioned within the picture frame of the shutter.
2. Set the shutter block onto the attachment. Then release the shutter several times and check that the indication of the shutter tester is correctly given. If the indication runs, refer to the instructions of the shutter attachment.
  3. Connect the 4 lead wires of the shutter block to the tester (ST-5101).

### ■ Measurement and adjustment

- Before measurement, make sure that the standard circuit is correctly operated by the SS-CAL button of ST-5101.
1. Adjustment of uneven exposure  
 Set the SS-SEL dial of ST-5101 to 1000 and adjust by changing the position of exposure adjustment plate (2036) so that the difference in indication between range A and B of the shutter tester is minimized.

■ Fig. 2



## 2. Check and adjustment of 1/1000

Set the SS-SEL dial of ST-5101 to 1000, then release the shutter several times, make sure that the indication of the shutter tester is within the range of 1.05ms to 1.76ms (standard value: 1.38ms...Note). Do the same with the V-SEL dial of ST-5101 set at 1.85(V).

**Note:** When shutter attachment (273-0201-75) is used in the measurement, a correction value is added to the standard value because the measuring conditions are different from those in the measurement of an ordinary 35mm camera.

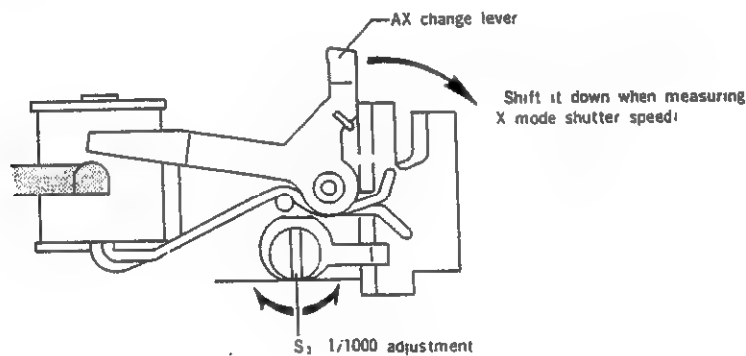
- When the shutter speed is outside the range of 1.05ms to 1.76ms, adjust by turning  $S_3$  (trigger SW contact). ( $S_3$  is re-adjusted during EE adjustment, and keeping the shutter speed within the specified range will facilitate EE adjustment.)
- If there is a great variation in shutter speed, check the operation of each lever, shutter blade operation, disengagement of second blade, and the condition of  $S_3$ .

## 3. X mode shutter speed check

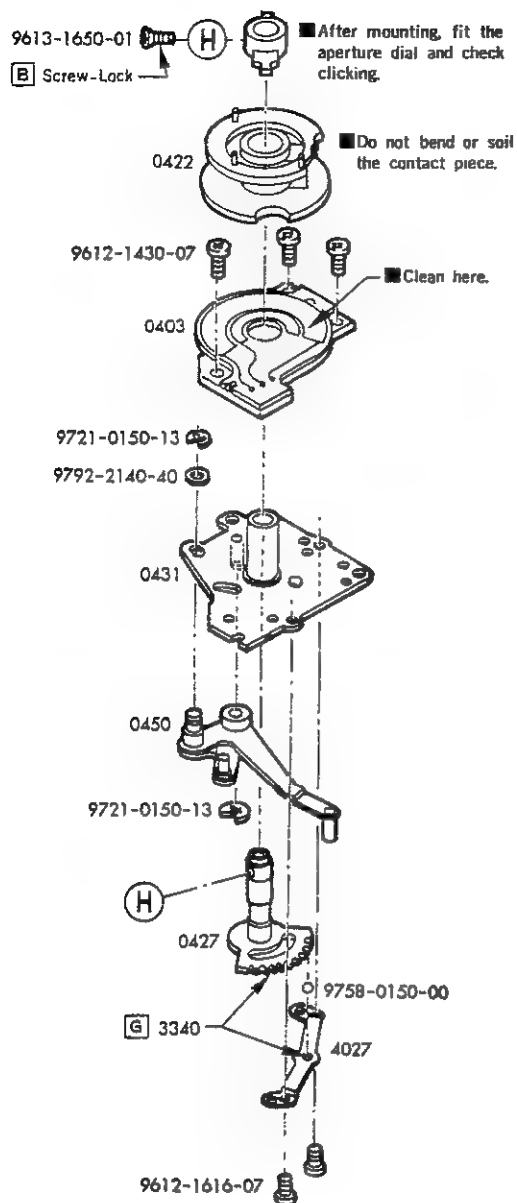
Shift down the AX change lever in the direction of the arrow in Fig. 3, then release the shutter with ST-5101 power switch set at OFF or disconnected from the shutter.

In this case, the indication of the shutter tester should be 6.3ms to 9.61ms.  
(Standard value: 7.81ms...No correction value in the case of X)

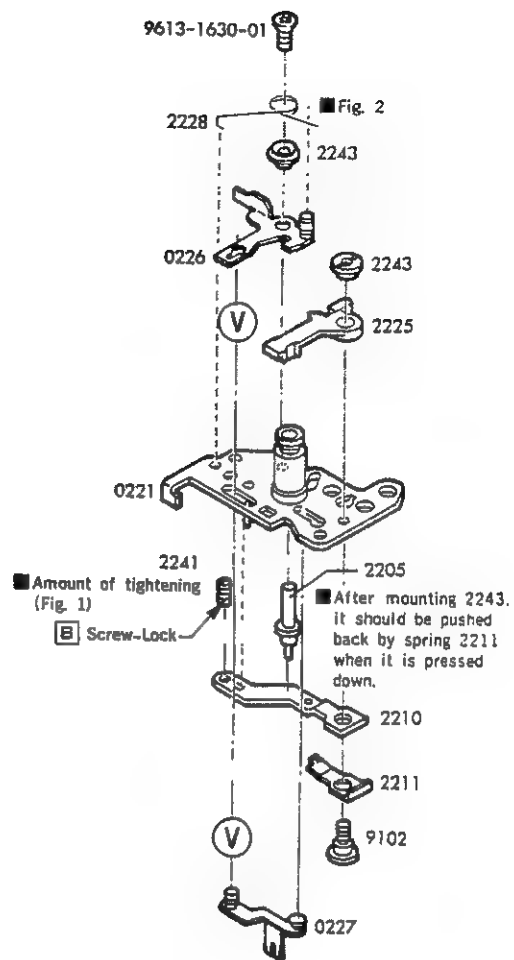
■ Fig. 3



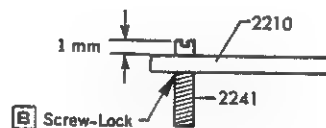
## Aperture base plate assembly



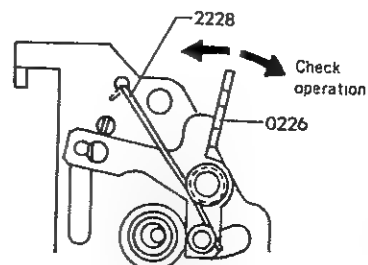
## Mode base plate assembly



■ Fig. 1 Tightening of 2241

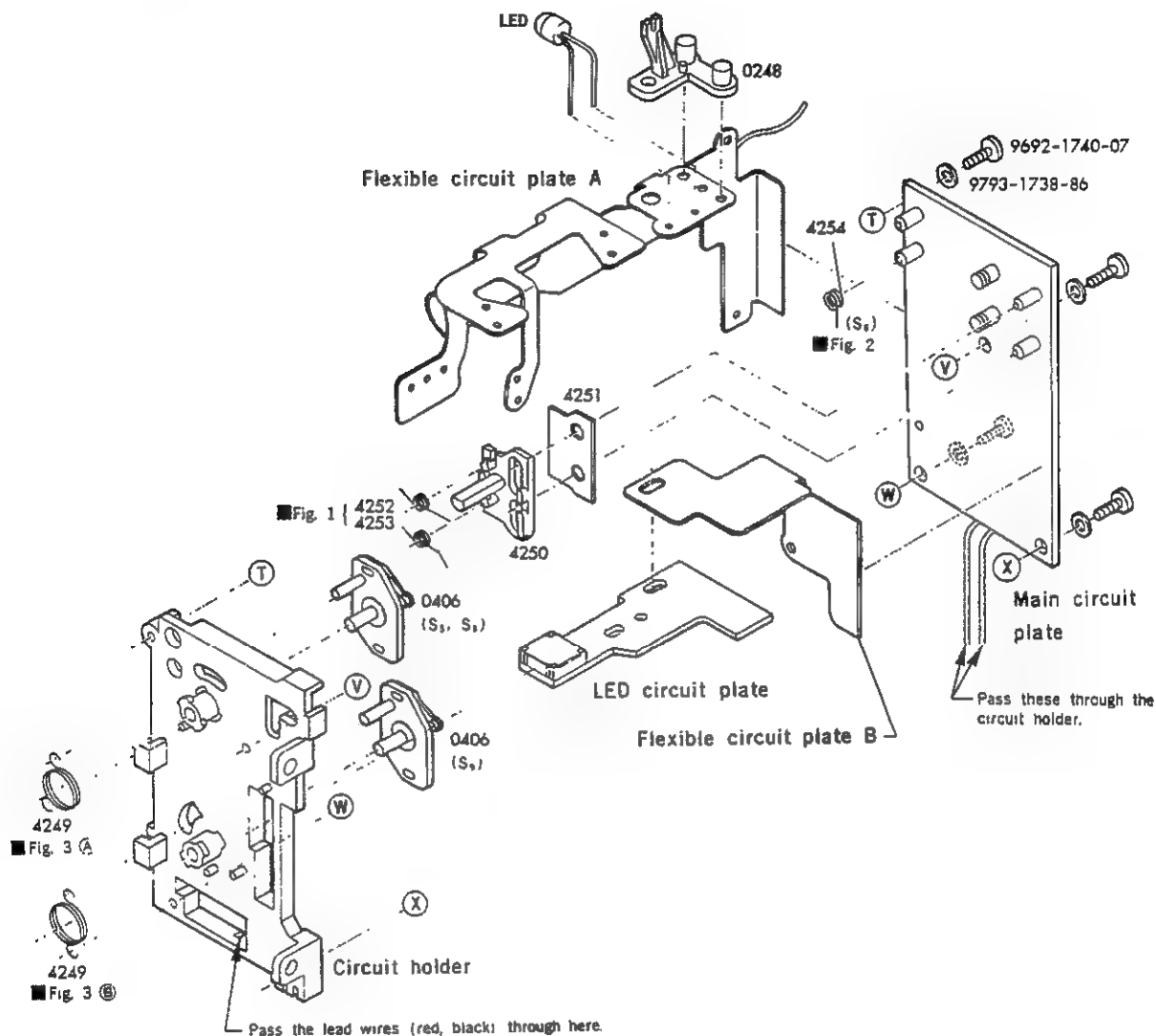


■ Fig. 2 2228 spring setting



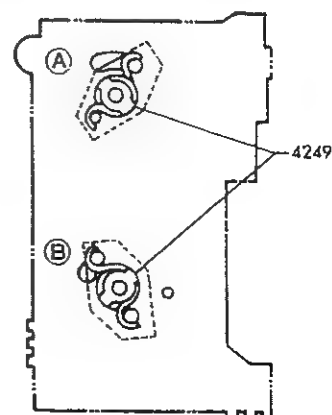
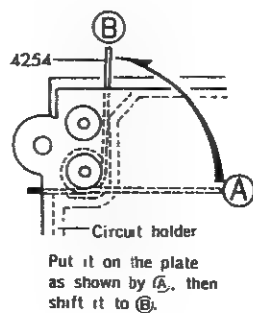
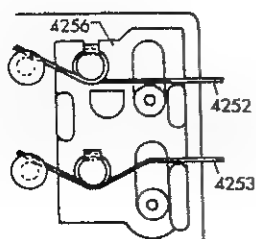
## ■ Circuit plate assembly

- During disassembly, take particular care not to allow the spring (switch contact 4254) to pop out.
- During assembly, carefully clean the contact pieces, switch pattern, and pins of main circuit plate.



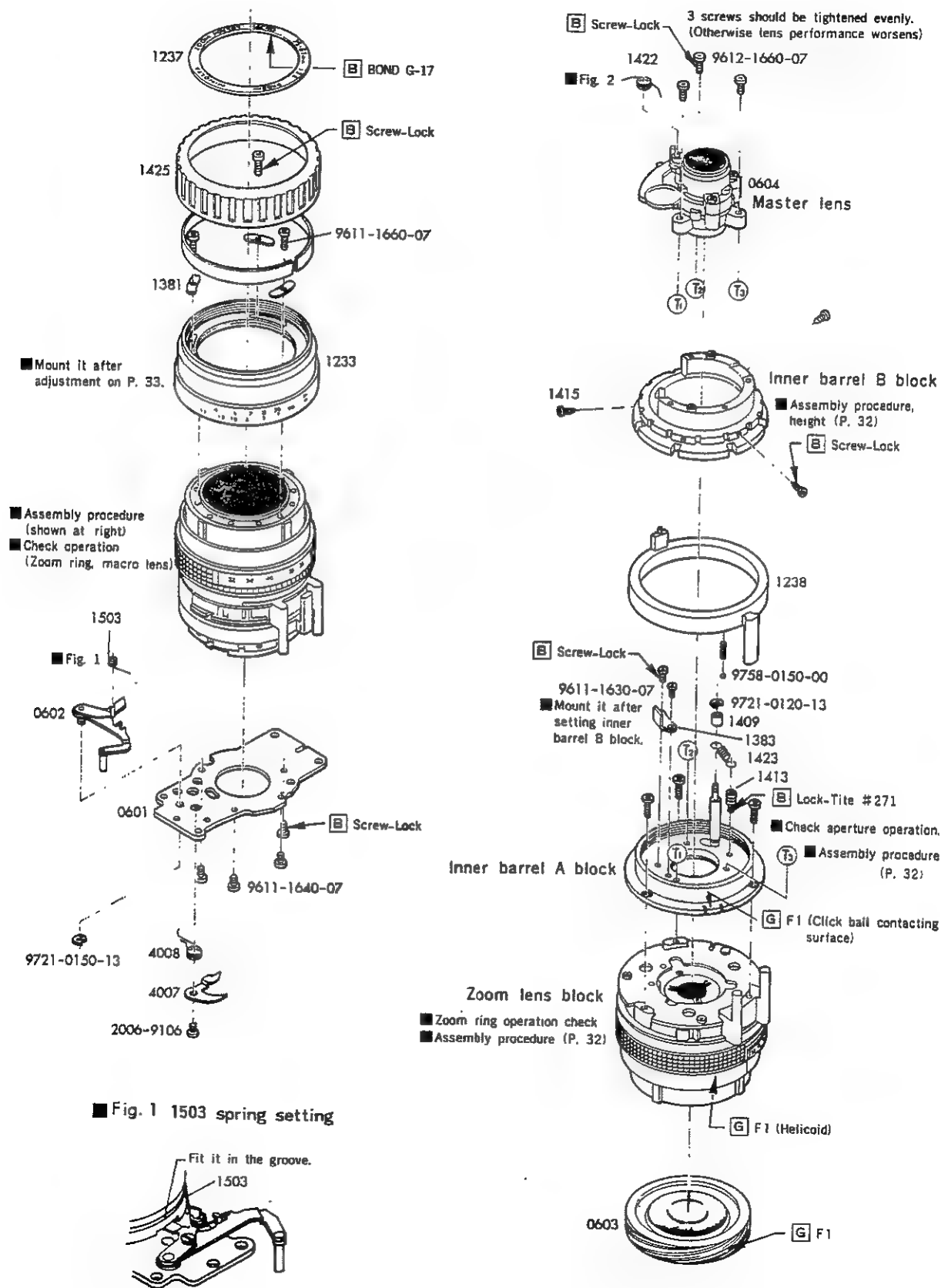
■ Fig. 1 4252, 4253 spring setting ■ Fig. 2 4254 spring setting

■ Fig. 3 4249 spring setting

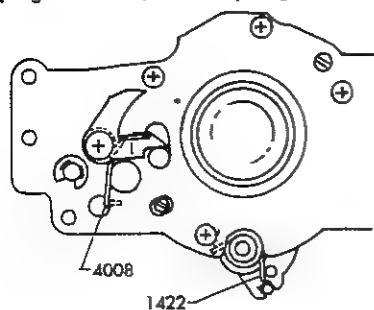


## ■ Lens block assembly

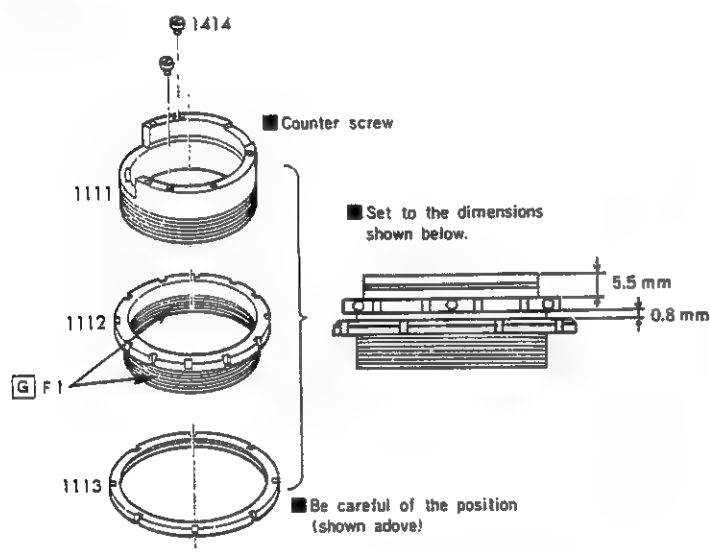
■ If the lens block is disassembled as shown on P. 31-32, make the focus adjustment according to the procedure on P. 33.



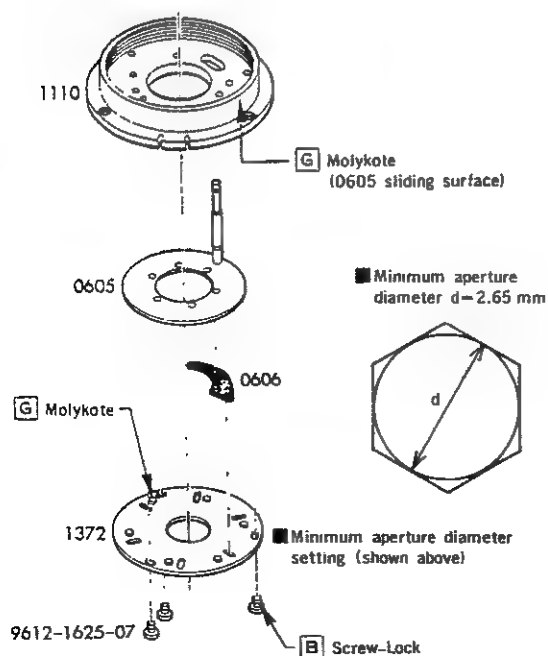
■ Fig. 2 1422, 4008 spring setting



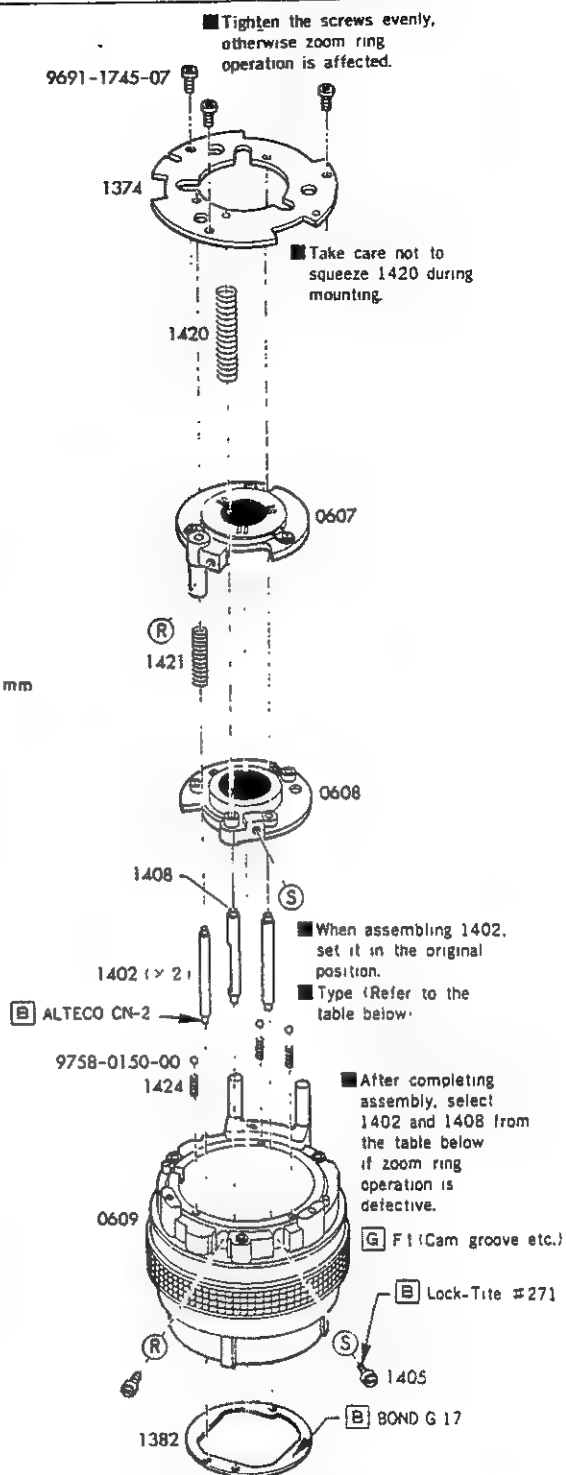
## ■ Inner barrel B block assembly



## ■ Inner barrel A block assembly



## ■ Zoom block assembly



### ■ 1402 (Moving lens guide bar-A)

3576-1402-01	d=2.0mm
3576-1402-81	d=2.01mm
3576-1402-82	d=1.99mm

### ■ 1408 (Moving lens guide bar-B)

3576-1408-01	d=2.0mm
3576-1408-81	d=2.01mm
3576-1408-82	d=1.99mm

## ■ Focus movement and focus adjustment

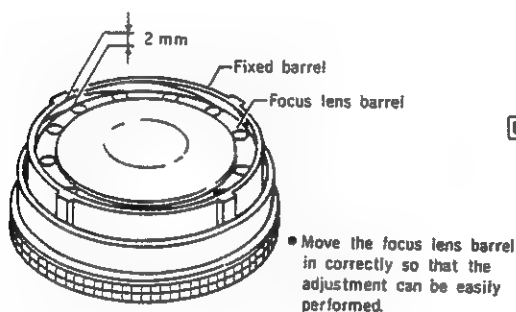
Perform these adjustments when the lens block is disassembled as shown on P. 31~32. If the lens block is not included in the disassembly procedure, perform only the focus adjustment on P. 8.

- Measuring instruments : Auto collimator (120 mm or 200 mm)  
 : Focus adjustment mirror (251-3357-76)  
 : Focus adjustment wrench (273-1112-75)

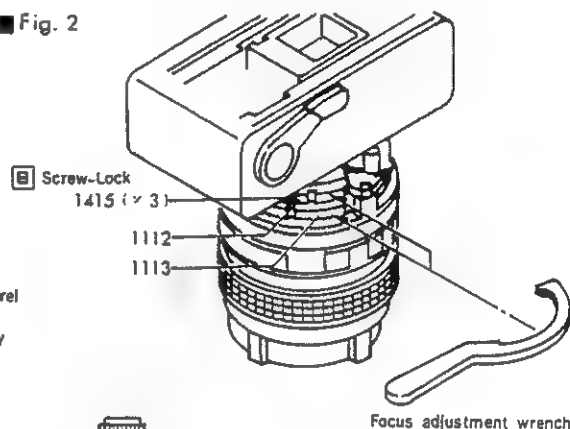
### ■ Preparations

1. Rotate the focus lens barrel to move it in by 2mm from the fixed barrel front edge, as shown in Fig. 1.
2. Loosen the focus adjusting nut B (1113) and screw (1413×3). (See Fig. 2)
3. Set the aperture to open, and set the camera opposite to the auto collimator. (Fig. 3)

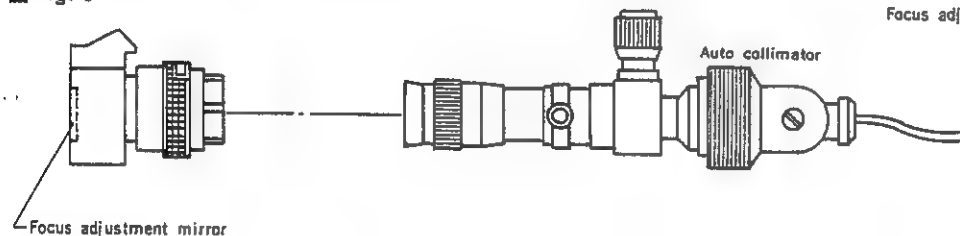
■ Fig. 1



■ Fig. 2



■ Fig. 3



### ■ Adjusting procedure

1. Adjust according to the items given in the table below.

Step	Zoom ring	Auto collimator position	Adjustment & check
1	25 mm	200 mm..... +28 scale 120 mm..... +10.8 scale	Rotate focus adjusting nut A (1112) up to the optimum focus position.
2	67 mm	200 mm..... +4.3 scale 120 mm..... +1.7 scale	Turn the focus lens barrel to the optimum focus position.
3	25 mm		Rotate the object lens of auto collimator and check the focus position. 200 mm..... 0 to +56 scale 120 mm..... 0 to +21.6 scale If the scale is out of the above range, adjust it by repeating the steps 1 and 2.

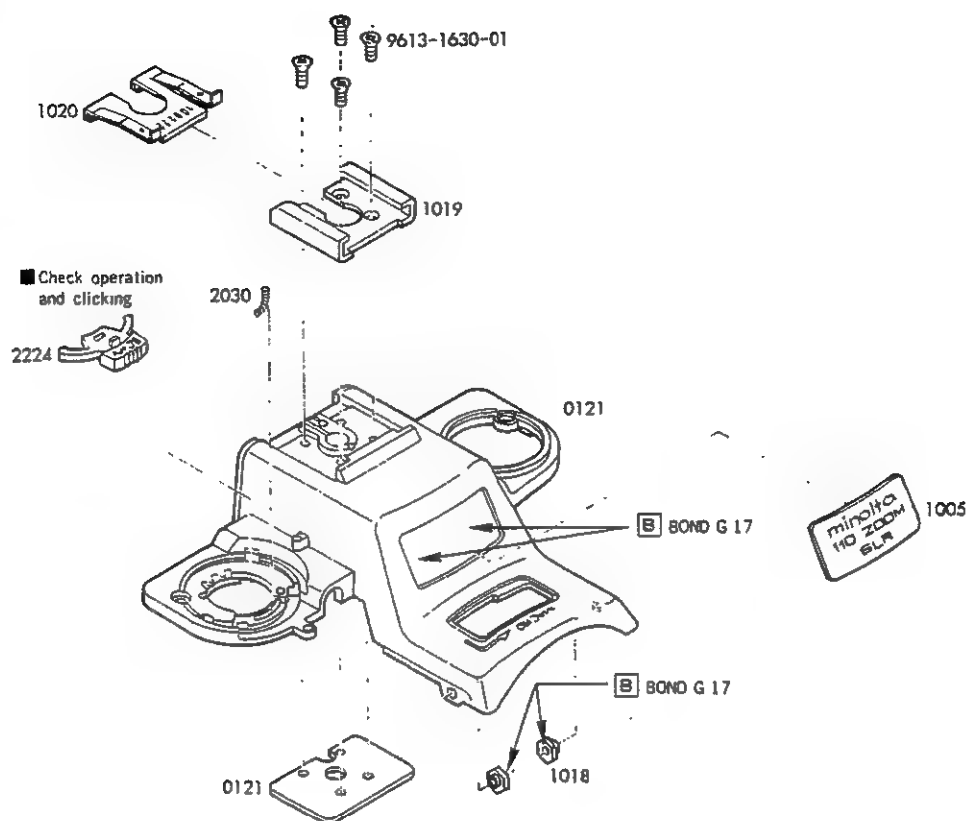
2. Evenly tighten the 3 screws (1415) followed by 1113, and then check that the focus position is within the range shown in the table.
3. Set the distance ring to infinity ( $\infty$ ) position, and secure it with distance scale ring set-plate and 9611-1660-07. In this case, be sure that the focus lens barrel does not rotate.
4. Make sure that the focus position is within the range shown in the following table, and then apply Screw-Lock to 1415.

(Standard)

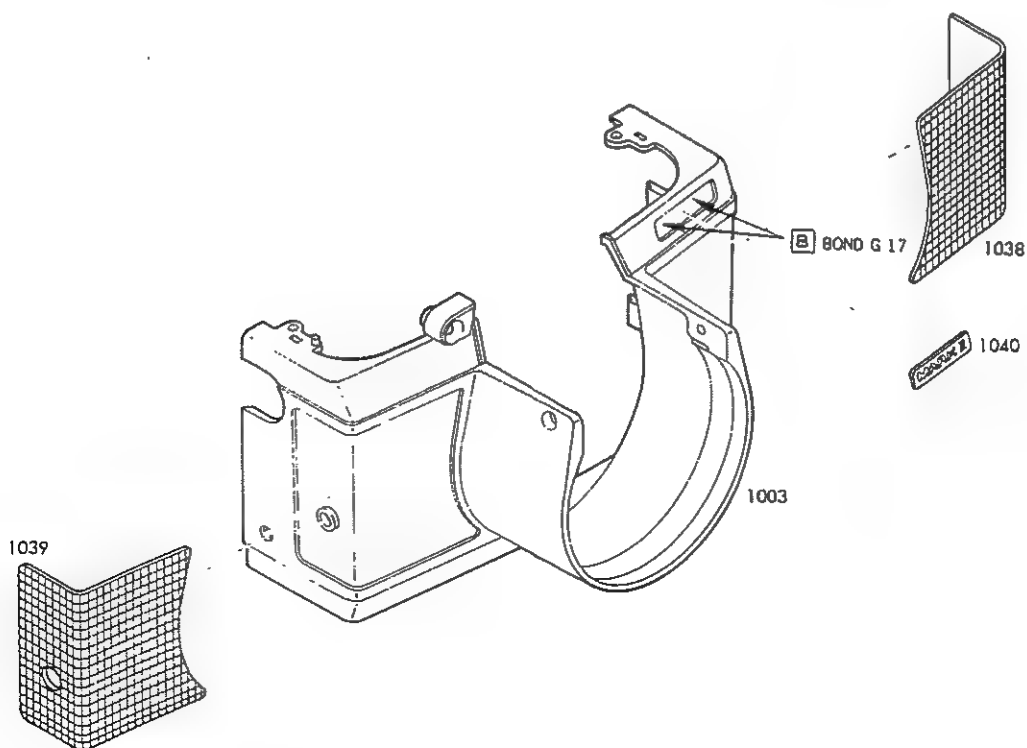
Distance ring	Zoom ring	Auto collimator	
		200 mm	120 mm
$\infty$		Allowable range	Allowable range
	67 mm	+2.6~+6.0 scale	+1.0~+2.3 scale
	25 mm	0~+56 scale	0~+21.6 scale



## ■ Top cover assembly

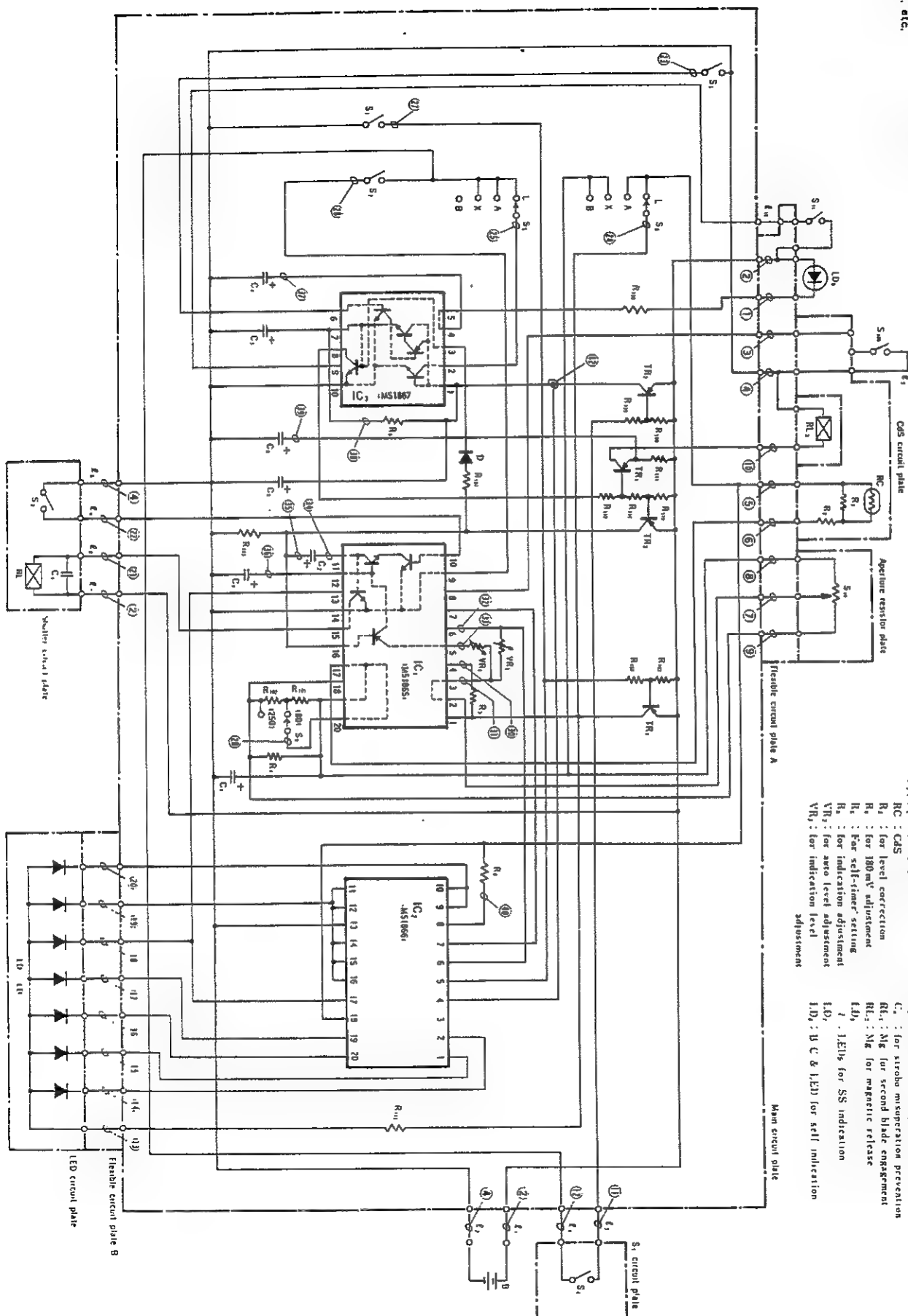


## ■ Front cover assembly



## 273 circuit diagram

The encircled numbers are identical with those used in the real wiring diagram. Use these numbers when checking the voltage, etc.



IC<sub>1</sub> (chip type) Banded on main  
IC<sub>2</sub> (chip type) circuit plate  
IC<sub>3</sub> (chip type) Printed on main  
TR<sub>1</sub> - TR<sub>2</sub> D  
R<sub>1</sub> - R<sub>20</sub> } for self oscillation  
R<sub>1</sub> - R<sub>20</sub> } for release delay  
R<sub>1</sub> - R<sub>20</sub> } for magnetic release  
R<sub>1</sub> - R<sub>20</sub> } for CDS correction  
R<sub>1</sub> - R<sub>20</sub> } for CDS correction  
R<sub>1</sub> - R<sub>20</sub> } for level correction  
R<sub>1</sub> - R<sub>20</sub> } for 180mV adjustment  
R<sub>1</sub> - R<sub>20</sub> } for self-timer setting  
R<sub>1</sub> - R<sub>20</sub> } for indication adjustment  
R<sub>1</sub> - R<sub>20</sub> } for auto level adjustment  
R<sub>1</sub> - R<sub>20</sub> } for indication level adjustment

C<sub>1</sub> for memory  
C<sub>2</sub> for extension  
C<sub>3</sub> for stable magnet separation  
C<sub>4</sub> for self oscillation  
C<sub>5</sub> for release delay  
C<sub>6</sub> for magnetic release  
C<sub>7</sub> for CDS correction  
C<sub>8</sub> for CDS correction  
C<sub>9</sub> for CDS correction  
C<sub>10</sub> for CDS correction  
C<sub>11</sub> for CDS correction  
C<sub>12</sub> for CDS correction  
C<sub>13</sub> for CDS correction  
C<sub>14</sub> for CDS correction  
C<sub>15</sub> for CDS correction  
C<sub>16</sub> for CDS correction  
C<sub>17</sub> for CDS correction  
C<sub>18</sub> for CDS correction  
C<sub>19</sub> for CDS correction  
C<sub>20</sub> for CDS correction

LD<sub>1</sub> - LD<sub>20</sub> for SS indication

LD<sub>1</sub> - LD<sub>20</sub> for SS indication

LD<sub>1</sub> - LD<sub>20</sub> for SS indication

### ■ Supplement for 273 circuit diagram

1. In the circuit of 273, the touch switch circuit, manual switch circuit and high luminescence lock circuit are omitted from the circuit of 2006. Also, SS indication (LED) is simplified and the setting of X mode (refer to the next paragraph) is included, but basically this circuit is identical with the circuit of 2006. The circuit operations such as light measuring, calculation and control of 273 are the same as in 2006. Therefore, for the description of each circuit and the analysis of electrical troubles, refer to the circuit description and the trouble shooting chart in the Service Manual of 2006.

2. X mode

In the case of 273, when the mode dial is set to X, the mode switch ( $S_8$ ) is shifted to X B side and simultaneously the shutter block is changed over to mechanical control mode. When the light measuring switch ( $S_1$ ) is set to ON, a voltage nearly equal to the supply voltage is applied to the No. 2 terminal of IC<sub>1</sub> (output of measuring circuit) irrespective of luminescence and aperture. Accordingly, the memory voltage becomes higher than that in auto mode. If the shutter is released under such a condition, the shutter magnet is demagnetized as the shutter starts operating, but the magnet operation lever is maintained mechanically until completion of the first blade travel, therefore the shutter operates at X speed (1/125 sec.).

3. Names of switches and operating conditions

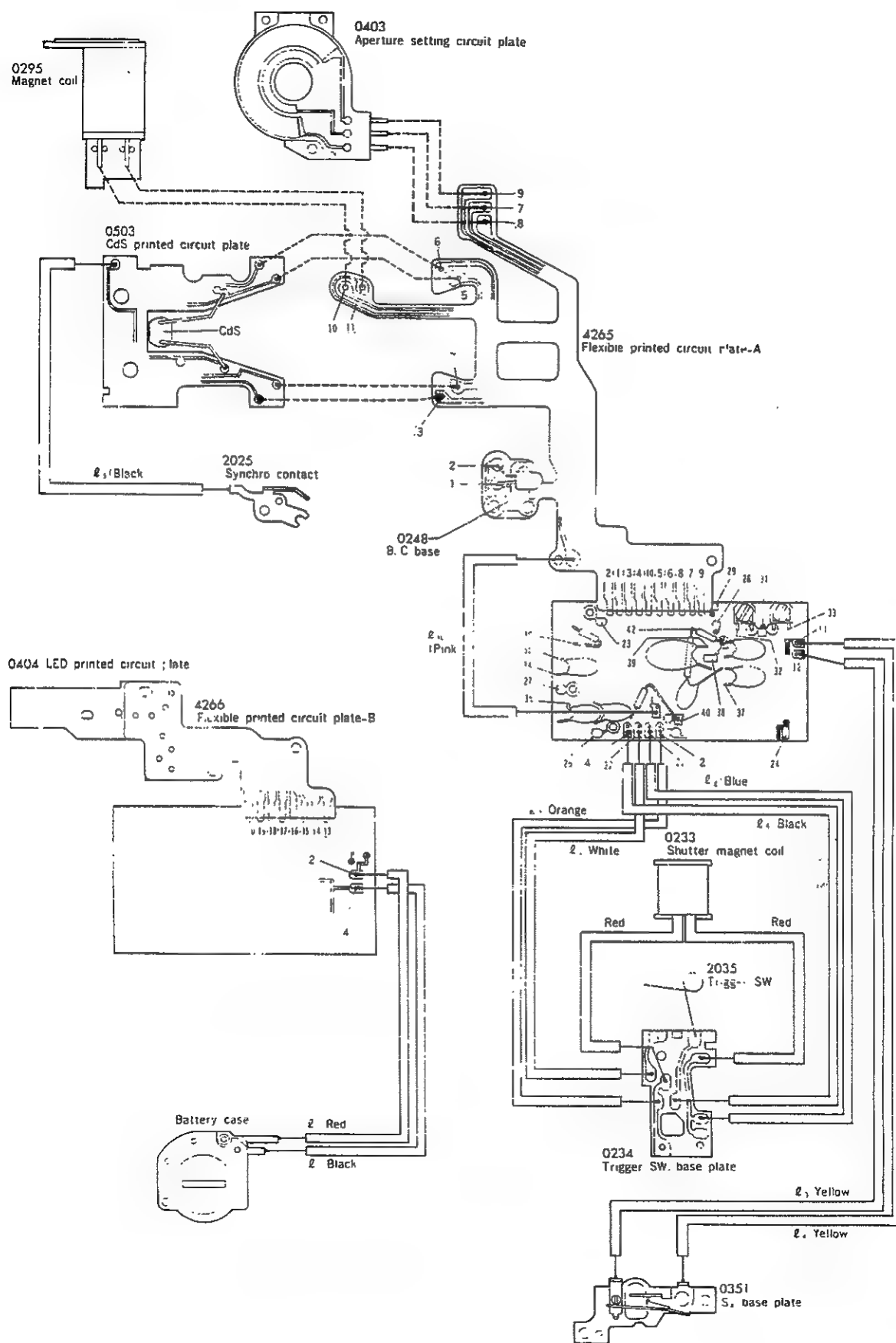
SW	Name of switch	Operating conditions
$S_1$	Light measuring switch	Interlocked with release button (ON when depressed)
$S_2$	Release switch	
$S_3$	Trigger switch	OFF immediately after start of shutter first blade travel.
$S_4$	Reset switch	ON with winding completed.
$S_5$	Mode switch (Bulb switch)	Inter locked with mode dial. (OFF at B)
$S_6$	Self switch	Interlocked with self lever.
$S_8$	Mode switch	Interlocked with mode dial.
$S_9$	ASA switch	Interlocked with film cartridge (250 without cartridge)
$S_{10}$	AV switch (aperture resistance)	Interlocked with aperture dial.
$S_{11}$	B.C switch	Interlocked with SELF lever.
$S_{100}$	Synchro switch	ON with shutter first blade travel completed.

$S_7$  (main switch) used in 2006 is omitted in 273.

4. Three-layer circuit plate

In the case of conventional printed circuit base plate, the circuit patterns are printed only on one or both sides of a one sheet of circuit plate. In the main circuit plate of 273, the patterns are printed not only on both sides of the plate but also on the surface between them, therefore the plate being identical in area can include more solid circuits.

# Wiring schematic diagram





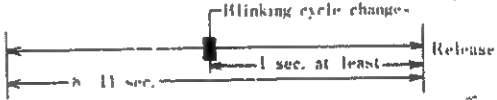

# Inspection Specification

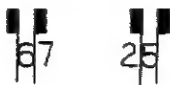
1. This specification includes the allowable quality levels in the production line so that we can guarantee the quality of products to the general users. The specifications are given in detail item by item so that you can refer to them when handling the requirements of users. Also, you can use the specifications for rechecking the products after completion of repair.
2. When carrying out outgoing or incoming inspections, do not directly apply the specifications to the measured values but correctly understand the purposes of the inspections and then do the checkings, for instance, in accordance with the incoming inspection specification manual.
3. Some users with special purposes may sometimes require different specifications because they are not satisfied with this specification. In that case, give priority to the users' requests and then make the necessary adjustments after checking to see if they are possible or not.

## 273 Inspection Standards

Items	Portions	Contents
Film winding	Film advance lever	Operation..... • Operation should be smooth without excessive unevenness in speed. • When lever is released at complete winding position it should not spring back. Looseness..... There should be no excessive looseness in vertical motion. (less than 0.3mm)
	Film feed	Winding stop... • Film should not stop at film leader, allowing continuous winding. • Film should stop at every frame, and each stroke should complete winding of each frame. • Film stopper should not work with cartridge sensor pushed in, and it should work after next winding with sensor shifted back, and it should be possible to release it.
		Perceive lever... • Operation should be smooth when the lever is slide in the direction of winding gear with the finger, on completion of film winding. • Perceive lever should return to the original position after release.
		Winding gear ... • With cartridge inserted, gears should engage each other. • Gears should not run idle or reversely when resistance is applied by hand while holding the cartridge sensor.
	Ratchet	Pawl should engage with every tooth, and with it disengaged, shutter charge and film feed should be complete.
Finder	Vision	Check for infinity (∞) matching, image deflection (less than 1.5°), dust, mark.
	LED indication	• There should be no visual defect when viewed with the eye fixed in the right position. • There should be no excessive dust, scratch, shade, etc. • When finder is darkened, there should be no excessive leakage of light of LED.
	Visibility adjustment	Lever operation should be smooth and appropriate, and eyepiece lens should move smoothly permitting visibility changeover.

Items	Portions	Contents																							
Finder	Eyepiece shutter	Lever operation...It should click without excessive looseness.																							
Focus		(Specification) <table><tr><td rowspan="3">Zoom ring</td><td colspan="4">Auto collimator</td></tr><tr><td colspan="2">200 mm</td><td colspan="2">120 mm</td></tr><tr><td>Std. value</td><td>Reference value</td><td>Std. value</td><td>Reference value</td></tr><tr><td>67 mm</td><td>+4.3 (scale)</td><td>+2.6~+6.0 (scale)</td><td>+1.7 (scale)</td><td>+1.0~+2.3 (scale)</td></tr><tr><td>25 mm</td><td></td><td>0~+56 (scale)</td><td></td><td>0~+21.6 (scale)</td></tr></table>	Zoom ring	Auto collimator				200 mm		120 mm		Std. value	Reference value	Std. value	Reference value	67 mm	+4.3 (scale)	+2.6~+6.0 (scale)	+1.7 (scale)	+1.0~+2.3 (scale)	25 mm		0~+56 (scale)		0~+21.6 (scale)
Zoom ring	Auto collimator																								
	200 mm			120 mm																					
	Std. value	Reference value	Std. value	Reference value																					
67 mm	+4.3 (scale)	+2.6~+6.0 (scale)	+1.7 (scale)	+1.0~+2.3 (scale)																					
25 mm		0~+56 (scale)		0~+21.6 (scale)																					
Back cover	Back cover	Opening/closing... <ul style="list-style-type: none"><li>• Back cover locking should be perfect without excessive looseness (less than 0.2 mm).</li><li>• When unlocked with cartridge inserted, back cover should smoothly come open.</li></ul>																							
	Cartridge spring	<ul style="list-style-type: none"><li>• Spring power should be sufficient, and it should return to the original position even when pressed up to back cover plate.</li><li>• It should not come loose even when pulled towards you.</li></ul>																							
Mode dial/ Aperture dial	Mode dial	Operation..... It should click without excessive looseness.																							
		Lock..... <ul style="list-style-type: none"><li>• It should be locked completely at position A.</li><li>• Dial rotation should be possible with lock button depressed.</li><li>• Release button should be completely locked in lock position.</li></ul>																							
		Index deflection...Center of each character should be in contact with the index. <div></div>																							
	Aperture dial	Operation..... Check for defective movement, clicking, looseness (less than 0.2 EV in exposure).																							
		Index deflection...Center of each aperture value character should be in contact with the index. <div></div>																							
	Over-ride	Operation..... <ul style="list-style-type: none"><li>• Operation should be smooth without catching.</li><li>• It should fit in lock groove completely.</li></ul> Index deflection...Deflection of each character from the index should not be excessive.																							
Shutter function	Release button	Operation..... Shutter release should be smooth, and release button should return to the original position.																							
		Push pressure...250~450 g																							

Items	Portions	Contents
Shutter function	Release button	Stroke..... <ul style="list-style-type: none"> <li>• Start : <math>0.5 \pm 0.3</math> mm higher from button base.</li> <li>• LED ON : <math>0 \pm 0.3</math> mm from button base surface.</li> <li>• Release : <math>0.7 \pm 0.3</math> mm lower from button base.</li> <li>• LED ON until release : 0.5 mm at least.</li> <li>• Allowance : 0.3 mm at least.</li> </ul> Lock position... $0.25 \pm 0.3$ mm higher than button base. (LED should not light up.)
	Shutter	<ul style="list-style-type: none"> <li>• It should work exactly when release button is pressed quickly or slowly.</li> <li>• Shutter blade should not open during winding.</li> <li>• There should be no bounce of blade and no re-exposure (causing no defect).</li> <li>• Shutter speed should change according to the amount of light entering through the lens and the alteration of aperture.</li> </ul>
	ASA detection lever	Operation..... Lever should operate smoothly and return to the original position correctly.
		Both LED indication and shutter speed should change with the lever depressed.
Self-timer	Self-timer lever	Operation..... <ul style="list-style-type: none"> <li>• It should click, and return (with hand off the B.C position.)</li> <li>• When lever is set to SELF and mode dial at L it should return to the original position.</li> </ul>
		Index..... With lever set to SELF, the index (orange) should not be shaded by self-timer lever.
	LED	<ul style="list-style-type: none"> <li>• After pushing release button, LED should start blinking within 1 sec. and its blinking cycle should become faster just before release.</li> <li>• Blinking cycle</li> </ul>  <ul style="list-style-type: none"> <li>• When SELF lever is shifted back within 3 seconds after pressing release button, self-timer operation should be cancelled exactly, allowing no release.</li> </ul>
Lens block	Helicoid	Operation..... It should operate without squeaking, looseness, excessive resistance, etc.
		Stop position... <ul style="list-style-type: none"> <li>• Index deflection on infinity ... side should be less than 1/2 of character width.</li> <li>• Index should go beyond the character 1.1 on short distance side.</li> </ul> 
	Zoom ring	Operation..... There should be squeaking, looseness, excessive resistance, etc. irrespective of camera position.

Items	Portions	Contents														
Lens block	Zoom ring	Stop position--- Deflection of character from the index at zoom ring stop position should be as follows: 														
	Macro lever	Operation----- <ul style="list-style-type: none"><li>• There should be no excessive irregularity catching, looseness.</li><li>• With macro released, the lever should return to the original position.</li></ul>														
Battery compartment	Contact piece	There should be no corrosion, soiling, bending, or improper contact pressure.														
General performance	Auto exposure	<p>The specification shown below should be satisfied. (Camera: ASA 80, EE tester: EE 2101, EE 2111)</p> <table><tr><th>Luminance</th><th>Aperture</th><th>Allowable range of EE tester indication</th><th>Variation</th></tr><tr><td>BV 0</td><td>F 4</td><td rowspan="4">+0.3±1 EV</td><td rowspan="4">Within 0.5 EV</td></tr><tr><td>BV 4</td><td>F 3.5~F 4</td></tr><tr><td>BV 6</td><td>F 3.5~F 16</td></tr><tr><td>BV 9</td><td>F 4</td></tr></table>	Luminance	Aperture	Allowable range of EE tester indication	Variation	BV 0	F 4	+0.3±1 EV	Within 0.5 EV	BV 4	F 3.5~F 4	BV 6	F 3.5~F 16	BV 9	F 4
	Luminance	Aperture	Allowable range of EE tester indication	Variation												
	BV 0	F 4	+0.3±1 EV	Within 0.5 EV												
BV 4	F 3.5~F 4															
BV 6	F 3.5~F 16															
BV 9	F 4															
Film speed changeover error	<p>The specification shown below should be satisfied. (Camera: ASA 250, EE tester: EE 2101, EE 2111)</p> <table><tr><th>Luminance</th><th>Aperture</th><th>ASA</th><th>Allowable range of EE tester indication</th></tr><tr><td>BV 6</td><td>F 8</td><td>250(※)</td><td>Within 0±1.0 EV &amp; EE level of ASA 80±0.3 EV.</td></tr></table> <p>※Set ASA dial of EE tester (EE 2101, EE 2111) to 200.</p>	Luminance	Aperture	ASA	Allowable range of EE tester indication	BV 6	F 8	250(※)	Within 0±1.0 EV & EE level of ASA 80±0.3 EV.							
Luminance	Aperture	ASA	Allowable range of EE tester indication													
BV 6	F 8	250(※)	Within 0±1.0 EV & EE level of ASA 80±0.3 EV.													
Over-ride changeover error	<p>The specification shown below should be satisfied. (Camera: ASA 80, EE tester: EE 2101, EE 2111)</p> <table><tr><th>Luminance</th><th>Aperture</th><th>Over-ride</th><th>Allowable range of EE tester indication</th></tr><tr><td rowspan="2">BV 6</td><td rowspan="2">F 8</td><td>0</td><td>+0.3±1.0 EV</td></tr><tr><td>+2~-2</td><td>Check the EE error when the over-ride amount is 0; check EE when the over-ride amount is +2 to -2; and confirm that the over-ride error is within ±0.5 EV when its amount is 0.</td></tr></table>	Luminance	Aperture	Over-ride	Allowable range of EE tester indication	BV 6	F 8	0	+0.3±1.0 EV	+2~-2	Check the EE error when the over-ride amount is 0; check EE when the over-ride amount is +2 to -2; and confirm that the over-ride error is within ±0.5 EV when its amount is 0.					
Luminance	Aperture	Over-ride	Allowable range of EE tester indication													
BV 6	F 8	0	+0.3±1.0 EV													
		+2~-2	Check the EE error when the over-ride amount is 0; check EE when the over-ride amount is +2 to -2; and confirm that the over-ride error is within ±0.5 EV when its amount is 0.													



Items	Portions	Contents																																																																			
General performance	LED indication	The specification shown in the table below should be satisfied. (Camera: ASA 80)																																																																			
		<table><tr><th>Luminance</th><th>Aperture</th><th colspan="5">Allowable indication range (<math>\pm 1.0</math> EV)</th></tr><tr><td rowspan="3">BV 6</td><td rowspan="3">F 3.5</td><td>250</td><td>☀</td><td>☀</td><td>●</td><td>●</td><td>●</td></tr><tr><td>125</td><td>●</td><td>☀</td><td>☀</td><td>☀</td><td>●</td></tr><tr><td>60-4</td><td>☀</td><td>☀</td><td>☀</td><td>☀</td><td>☀</td></tr><tr><td rowspan="3">BV 9</td><td rowspan="3">F 3.5</td><td></td><td>☀</td><td>☀</td><td>▲</td><td>▲</td><td>▲</td></tr><tr><td>1000</td><td>●</td><td>☀</td><td>☀</td><td>☀</td><td>●</td></tr><tr><td>500</td><td>●</td><td>●</td><td>●</td><td>☀</td><td>☀</td></tr><tr><td rowspan="3">BV 0</td><td rowspan="3">F 3.5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>60-4</td><td>☀</td><td>☀</td><td>☀</td><td></td><td></td></tr><tr><td></td><td>▼</td><td>☀</td><td>☀</td><td></td><td></td></tr></table>	Luminance	Aperture	Allowable indication range ( $\pm 1.0$ EV)					BV 6	F 3.5	250	☀	☀	●	●	●	125	●	☀	☀	☀	●	60-4	☀	☀	☀	☀	☀	BV 9	F 3.5		☀	☀	▲	▲	▲	1000	●	☀	☀	☀	●	500	●	●	●	☀	☀	BV 0	F 3.5							60-4	☀	☀	☀				▼	☀	☀		
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			▼	☀	☀																																																																
Synchronizer	X delay time	Check with strobo retarder. <table><tr><td>Standard</td><td>After full opening of shutter, X contact should turn ON, and there should be at least 2 ms until appearance of second blade.</td></tr></table>	Standard	After full opening of shutter, X contact should turn ON, and there should be at least 2 ms until appearance of second blade.																																																																	
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	Insulation resistance	30 M $\Omega$ at least (D.C 500 V insulation resistance meter)																																																																			
Compatibility with strobo	LED indication	Set up strobo (Minolta) with synchro auto control circuit, and set the camera mode to a position other than L, then set the light measuring switch to ON and observe the alteration of LED indication. • Normal shutter speed should be indicated until completion of charge (no indication at B.X), and LED for 1/125 should blink on completion of charge.																																																																			
	Synchronization	On completion of charge, synchronization should be attainable irrespective of dial position.																																																																			
Voltage specification, etc.	B.C voltage	<table><tr><th>Standard</th><th>Allowable range</th></tr><tr><td>2.0 <math>\pm</math> 0.20 (V)</td><td>LED should not light up at 1.8 V LED should light up at 2.2 V.</td></tr></table> (Measuring temp: 25°C $\pm$ 5°C)	Standard	Allowable range	2.0 $\pm$ 0.20 (V)	LED should not light up at 1.8 V LED should light up at 2.2 V.																																																															
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	Turn-OFF voltage for LED in finder	<table><tr><td>Standard</td><td>LED should light up when B.C is on.</td></tr></table>	Standard	LED should light up when B.C is on.																																																																	
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Release lock voltage	<table><tr><th>Standard</th><th>Allowable range</th></tr><tr><td>2.0 <math>\pm</math> 0.20 (V)</td><td>Release lock should work at 1.75 V. Release should work at 2.20 V.</td></tr></table>	Standard	Allowable range	2.0 $\pm$ 0.20 (V)	Release lock should work at 1.75 V. Release should work at 2.20 V.																																																																
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Performance guarantee voltage	1.85 V (※) ~ 3.0 V (Constant voltage power supply: 2.25 ~ 2.8 V) ※ When release lock voltage ranges from 1.85 V to 2.20 V, the voltage required for release lock.																																																																				
Minimum operation voltage	There should be no abnormality with respect to speed, etc. until release lock.																																																																				

Items	Portions	Contents	
Voltage specification, etc.	Current consumption	D. C power source voltage: 2.8 V	
		Item	Standard
		B. C ON	35 mA or less
		LED ON (1, 2)	10 mA or less
		Light measuring	
		Release, Self	30 mA or less

**Minolta**